COAL AGE

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Spanish Influenza

BY FLOYD W. PARSONS

WE MUST have the necessary fuel to carry on our tremendous war effort. Perhaps the most serious menace at the present moment is the prevalence of the epidemic known as Spanish influenza, which is now sweeping the country. This disease is causing a reduction in the output of coal in nearly all of our important fields, but in central Pennsylvania the losses in production are greatest, averaging more than 100,000 tons per week. Many mines have been completely closed down, and in other collieries the output has been curtailed 50 per cent.

The strictest kind of preventive measures must be put into effect immediately, or we will be obliged to record industrial losses that will be of as great consequence as a major defeat on the battlefield. The remedy for the scourge lies in the hands of each individual. We can render no greater patriotic service now than to exercise a degree of caution and care surpassing anything we have ever done before.

The present disease is no more Spanish than it is Russian, Swedish or Dutch. It is a byproduct of the war and is undoubtedly due to a scarcity of proper food and a lack of warmth. People who are hungry and cold cannot well resist the inroads of the organism that is the cause of this disease. The present influenza germ is serious because it has become strong and healthy in the under-nourished bodies of the underfed people of Europe.

I am not a doctor and cannot speak with the authority of one versed in medicine. However, *Coal Age* is earnest in its desire to help remove the menace, and high authorities versed in diseases of this kind have furnished us with valuable information. Following are a few suggestions, concerning ways to avoid influenza:

Take one-half teaspoonful of bicarbonate of soda in a glass of cool water on arising in the morning. Spray the nose and throat with a standard spray solution such as is easily obtainable from any physician or at any drug store. Drink plenty of pure water one hour before or two hours after meals. In one or more of the glasses it will not hurt to put one-half teaspoonful of bicarbonate of soda or the juice of an orange or lemon. By all means keep the system in good shape and wholly avoid constipation.

People of low physical resistance due to lack of sleep, or to any kind of excess, present the best medium for the spread of the contagion. Liquors and intoxicants should be avoided because of the reduced physical resistance caused by them. Take exercise in the open air. Walk to the mines if possible and sleep in airy rooms. Remove wet and damp clothing at the earliest moment. Do not expectorate in the mines, for the germ will grow and become dangerous in a dark and damp surrounding. Wash hands before eating and have luncheon buckets and pails washed in scalding water once each day.

Miners should not congregate together in the mines and should stay away from men who are sneezing or suffering with colds. Keep your feet warm; wet feet demand prompt attention.

On the first signs of a chill, headache and bone ache, hurry home, and take a hot bath—as hot as you can stand—also a dose of castor oil. Drink hot drinks, preferably hot lemonade, and go to bed. Insist on being placed in a room by yourself and allow only the person nursing you in the room. Keep the windows open but let the room be heated. It has been demonstrated that heat, whether as fire, sunlight or high-temperature water, will destroy the organism.

To avoid pneumonia, which sometimes follows influenza, stay in bed until you are entirely well, and then do not expose yourself outdoors for two or three days after leaving your bed. Ninety per cent. of the pneumonia cases are contracted from arising too soon or from not going to bed immediately after the first chill.

Above all, don't worry. Do your level best to avoid contagion, and remember that by keeping well you are serving not only yourself but your country in its day of dire need.

IDEAS AND SUGGESTIONS

Methods of Tabulating and Computing Latitude and Departure Notes

BY O. H. HAMPSCH
Washington, D. C.

A well-defined method of tabulating and computing latitude and departure notes will be found of considerable value in plotting mine maps and ascertaining the distance between known or given stations. In Fig. 1 is shown a method of keeping notes that may be used in a record book, together with all computations for a ready reference.

The thirteen columns tabulated as shown form a complete record of each station, giving distance, bearing, angle, location, latitude and departure, which should be recorded from some base line or monument as a zero departure if possible. It will be of much convenience in record if the actual computations and figures

1	2	3	4	5	6	7	8	9	10	11	12	13
FROM STA.	TO STA.	HOR. ∠s TO RT.	BEARING	DIST	N. LAT. +	S. LAT −	E. DEP +	W. DEP −	TOTAL LAT	TOTAL DEP	REMARKS	STA.
105	106		S16°-24W						−12.163	−243.121	Intersection 4th Entry	106
106	107	42°-1′	N58°-25E	112.20	58.792		95.594		+46.629	+147.527	In 4th left Entry	107

FIG. 1

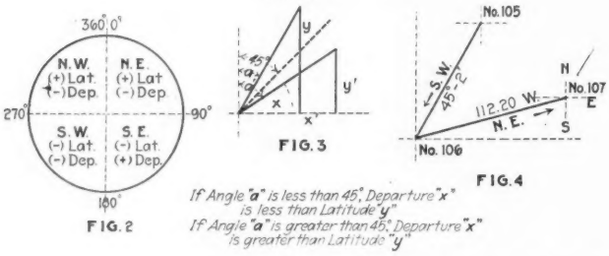

FIG. 2 FIG. 3 FIG. 4

If Angle "a" is less than 45°, Departure "x" is less than Latitude "y"
If Angle "a" is greater than 45°, Departure "x" is greater than Latitude "y"

FIGS. 1 TO 4. METHODS OF TABULATING AND COMPUTING LATITUDE AND DEPARTURE NOTES

can be made on the opposite side of the book—that is, with the record of stations on the left-hand side and computations and figures on right-hand side of the book. This will make it easy for reference to any particular station.

Figs. 2 and 3 are sketches which can be referred to by the computer when in doubt as to the relative sign of the latitude or departure for each quadrant (Fig. 2), and whether the latitude or departure is of the greater value (Fig. 3). Fig. 4 shows a simple sketch the computer may make to indicate the relative position of one station to the other and the direction or bearing each angle makes in reference to the other.

Any method of turning angles may be used, duplication, angles to the right or by quadrants, all of which of course give the same bearing and result. I have used the method of turning all angles to the right from the backsight to the foresight, and column 3, Fig. 1, may be changed from "horizontal angles to the right" to any method that may be used in any particular case.

Is It the Miner or the System?

The average human being is not loath to saddle the brunt of a situation upon an object or person most likely to bear it without retaliation. Following this general rule, the blame for the coal shortage has been thrust upon the miner, "digger," "loader," or whatever many have chosen to call him. He has been made the goat.

Is the miner, however, actually to blame for the coal shortage, or is it the system under which he labors in the average mine? Many mines, it is true, have no system at all, merely being operated according to tradition or supposition.

Despite the fact that many of the mine workers are foreign-born, an injustice is done many of them by baldly stating that they are unpatriotic; that they are un-Americanized. These men are just as human as the operator who employs them, and they will respond readily to the right kind of treatment. The average foreign-born mine worker has been forced down rather than up the social scale.

Suppose you, gentle reader, were a miner toiling in the bowels of the earth, breathing dust and continually risking your life. Could you perform your work if you were sworn at by every boss or sub-boss or other flunky in the mine? If you complained because of the lack of track or timbers or what-not, and somebody told you, "Aw, go to hell and get some," would you feel that you were a good American?

WHY MANY MINERS BECOME DISGRUNTLED

Suppose you loaded a carful of clean coal and then had it stolen by some thief who changed the checks. Would you feel like a good American if somebody laughed at your efforts to explain your troubles? And, if they promised to straighten it out and never did, would you feel like putting in a full day's work every day?

Suppose you told the office that you would need a certain amount of timber and track, so that you could start work early the following morning; and then found when you got to your place that there was nothing to help you make your place safe or rails on which to push the cars. Then suppose you wasted half a day chasing the mine foreman so he could get you fixed up. Wouldn't all of this talk about increased production strike you as being extremely ludicrous?

This condition does not exist in every mine, but it does exist in more mines than any of us have any idea of. Many of our large mines have a sympathetic and progressive management, but there are an appalling number of little fellows who get out a large tonnage as best they can; and by little fellows I do not mean wagon mines. I mean companies whose production runs 100,000 or 200,000 tons a year.

Most of these latter mines have a superintendent and a mine foreman, but these men cannot work efficiently for they have to do all of the "bossing," all of the clerical

work, and look after supplies, purchases, repairs and anything else under the sun. They must listen to the complaints of the daymen, the miners and the higher officials. An angel would give up in despair. As a consequence, they do just as you and I would do, just slide along as best they can and hit the high spots and miss the low spots; and the cleaning out of the "low spots" oftentimes determines the success of a mine or its failure.

Why not let the mine superintendent be a real superintendent? Why make an office boy, a clerk or a rancorous pessimist out of him? Why not fix it so that he can make his mine foreman be a real mine foreman for once in his life? He wants to be efficient and helpful to the miners, but he is so weighed down with his own woes that he justly feels that no one else has a right to unburden himself to him.

Give your foreman enough good helpers to carry out his orders, and then give him the authority to see that they are obeyed. You can hold him responsible, solely responsible, and he will be glad of it; for then he will have a chance to produce results. No man grows quite so fast as the man who is given a chance and is then held responsible for results. All superintendents are held responsible for the production and all foremen are held responsible for the conditions underground, but do they have the right kind of a chance?

The answer is bound to be a negative one, and just so surely is the shortage in desired production to a very large measure directly due to the lack of harmony which is brought about by the overworking and harassing of your first assistants.

It will cost you more money for a while, but for a very short while. In the end you will get greater production; and greater production is needed to back up our boys over there who are battling for humanity's sake, who are battling so that your family and my family will have a decent world to live in.

Spikeless Batteries

By Joseph Lawrence
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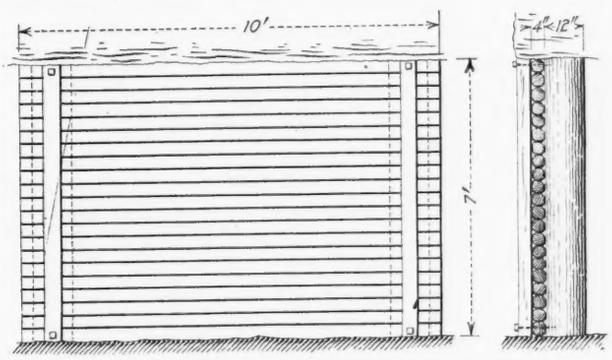
In building batteries in the mines it is customary to construct them of two props to which poles extending transversely are nailed. The props are about 7 ft. long and 12 in. in diameter while the poles are approximately 10 ft. long and 4 in. thick. These poles, 21 in number, are usually fastened to the props at either end with one 60d nail or spike.

The number of spikes used is thus 42 and as each



HOW THE USE OF SPIKES WAS OBVIATED

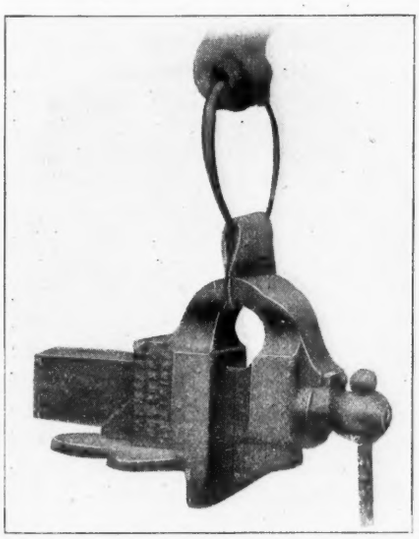
costs about ½ cent the entire cost for nails is 21 cents. Not only is this expense high but spikes of this size are becoming difficult to obtain.

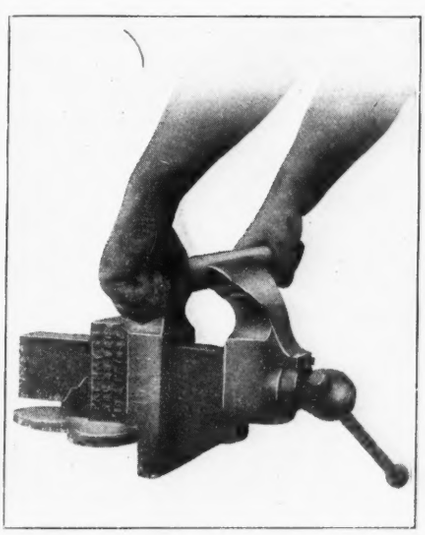
In order to obviate the necessity of using spikes at all I have followed the practice shown in the accompanying illustration. In this construction two extra poles of suitable length are placed parallel with the props and outside of the transverse poles. These outer pieces are held in place by a 12-in. rag spike or drift bolt at either end. These pierce the top and bottom transverse poles and hold them and all the others firmly.

Carrying a Heavy Vise

Two practical suggestions for carrying heavy vises are shown in Figs. 1 and 3. The carrier shown in Fig. 1 consists of a large iron ring on which a piece of rubber tubing is slipped to prevent the ring from cutting into the hand. A piece of leather belting is cut as shown in Fig. 2, folded over the ring and clamped in the vise jaws.

In Fig. 3 a wooden bar of suitable diameter and length is clamped in the vise jaws for carrying purposes. In this last application both hands can be used on very heavy vises. It is simple devices like these that make hard tasks easy.





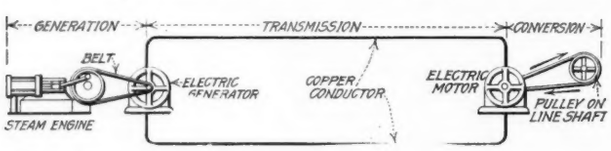
FIGS. 1 TO 3. TWO SIMPLE SUGGESTIONS FOR CARRYING A HEAVY VISE

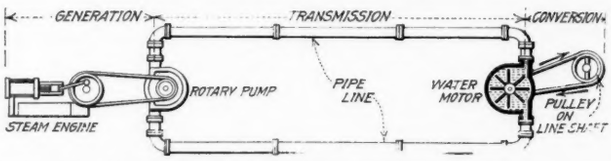
Fundamental Relations Between Direct- and Alternating-Current Circuits

By TERRELL CROFT
University City, St. Louis, Mo.

SYNOPSIS—*The theory of electricity is here dealt with. This theory is extremely interesting but requires a somewhat vivid imagination for its comprehension. Fundamental electrical units are also defined, as well as such terms as conductivity and resistivity.*

THE electron theory states that all matter is made up of molecules, of which there are millions of different kinds. Molecules are made up of atoms, of which there are but 92 different varieties; that is, there are but 92 elements now known. All atoms are composed of electrons, which are minute particles of negative electricity held normally in place in each atom by a positively charged something which has been named the "nucleus." The electrons thus interlocked in the atoms are, it is believed, constantly revolving at great speeds in regular circular orbits around the positive nuclei. In this they may be said to resemble the eight satellites which rotate about the planet Saturn. In a normal atom the amount of negative electricity





FIGS. 1. AND 2. AN ELECTRIC (LEFT) AND A HYDRAULIC CIRCUIT (RIGHT) FOR THE TRANSMISSION OF ENERGY

of the electrons is exactly neutralized by an equal amount of opposite or positive electricity of the nucleus. Thus a normal atom exhibits no external sign of electrification. The different kinds of atoms (the elements) differ only in the number of and the arrangement of the electrons and in the magnitude of the positive nuclei which compose them. The lighter elements have few electrons; the heavier elements many. A normal atom of any given element always has the same number of electrons and a positive nucleus of the same magnitude. Hydrogen, it is believed, consists of one electron and a corresponding positive nucleus. Uranium, the heaviest element, has probably 92 electrons and a correspondingly greater positive nucleus.

Thus everything about us, all matter, is composed of electricity. The electrons can, under certain circumstances, be forced from the atoms. The positive nuclei, so it is believed, cannot be moved from the atoms. Electrical phenomena occur when some of this electricity (electrons) is moved or when the electrical balance which normally obtains within the atoms is disturbed.

Electrons are exceedingly small. It is estimated that each has a diameter of about a five million, millionth of a centimeter $\left(\frac{1}{5{,}000{,}000{,}000{,}000}\text{ cm.}\right)$, or about a thirteen million, millionth of an inch $\left(\frac{1}{12{,}700{,}000{,}000{,}000}\text{ in.}\right)$ An electron weighs about one-forty-six billion, billion, billionth of an ounce

$$\left(\frac{1}{46{,}100{,}000{,}000{,}000{,}000{,}000{,}000{,}000}\text{ oz.}\right)$$

or about a seventeen hundredth $\left(\frac{1}{1700}\right)$ as much as does an atom of hydrogen.

It is evident that there is in the universe a certain definite amount of electricity. Electricity can neither be created nor destroyed. It can, however, be forced to move and thus transmit power or produce electrical phenomena. Electrical energy (not electricity) can be generated by forcing electrons to move through certain paths where it is desired that they should move.

An electromotive force (e.m.f.) is the name given to that tendency or force which makes electrons move or tends to do so. Thus, if an e.m.f. is impressed across the two ends of a wire, it will force the electrons of the atoms to move from atom to atom in the direction of the e.m.f. around in the wire, assuming, of course, that a closed conducting path is provided. A lightning flash is a movement of electrons through the atmosphere caused by an e.m.f. or voltage existing between the clouds and the earth.

An electric current consists of a movement or flow of electrons. Thus that which we call an "electric current" is merely a shifting of these electrons from atom to atom. If an electric current flows in a wire or in anything else, there is, then, a flow of electrons in that wire or thing. The coulomb is the unit of quantity of electricity and is somewhat analogous to our unit of quantity of water—the gallon. A coulomb of electricity comprises approximately five million, million, million (5,000,000,000,000,000,000) electrons.

The ampere is the unit of rate of flow of electricity and is analogous to "gallons per minute" in hydraulics. The ampere represents a rate of flow of one coulomb—that is, five million, million, million electrons—per second. It has been internationally agreed (recommended by the Chicago International Electrical Congress of 1893 and legalized by act of Congress 1894) that the ampere is "that unvarying current, which, when passed through a solution of nitrate of silver in water in accordance with standard specifications, deposits silver at the rate of 0.001118 gram per second."

Resistance is the name given to that opposition which

is offered by the materials to the movement of the electrons—that is, to the flow of an electric current—in them. The electrons of some materials, the metals for example, can be moved from atom to atom within the material with relative ease—that is, by the application of a small e.m.f. The materials in which the electrons can be easily moved from atom to atom are called "conductors." On the other hand, it is difficult to move the electrons from the atoms of other materials, such as air, glass, mica and porcelain. Such materials are called "insulators." However, there is no perfect conductor and no perfect insulator. All materials offer some opposition to the establishment of a current and there is no material in which a current cannot be established provided the impelling e.m.f. is sufficiently great. Witness again the lightning flash.

The ohm is the name given to the unit of electrical resistance. It affords a measure whereby the degree of opposition of the different materials to the establishment of an electric current in them may be measured. Practically speaking, the international ohm "is represented by the resistance offered to an unvarying electric current by a column of mercury at the temperature of melting ice, 106.3 centimeters long and having a cross-sectional area of 1 square millimeter."

A piece of No. 14 B. & S. gage copper wire of the size ordinarily used for branch wiring in lighting circuits 380 ft. long has a resistance of 1 ohm. A piece of No. 10 B. & S. gage copper wire 1000 ft. long has a resistance of almost precisely 1 ohm.

The volt is the unit of e.m.f.; that is, it is the unit whereby the tendency to establish electric currents may be measured. By international agreement, 1 volt is that e.m.f. which will establish a current of 1 amp. through a resistance of 1 ohm.

Electric Current Is Like a Hydraulic Flow

The general analogy between hydraulic and electric circuits should be appreciated. An electric circuit (Fig. 1) comprises conducting wires which are composed of readily moved electrons. These wires are arranged in air or in some other insulating material which tends to prevent the egress of electrons from the wire. Hence when a voltage developed by a generator, or by some other means, is impressed across the ends of the wire the electrons are forced to move around in the wire and through the conducting members connected to it. By the utilization of properly designed devices these moving electrons may be made to do work—to transmit electrical energy. Note that the copper transmission wire resembles a hole through the air through which the electrons can be moved with relative ease. Air is an insulator, so electrons can be moved through it only with the greatest difficulty.

Similarly, the hydraulic circuit of Fig. 2 comprises a pipe line full of water. The pressure developed by the pump will cause the water in the circuit to move and thus turn the water motor. Just as the electric circuit is full of electrons or electricity, the hydraulic circuit is full of water. Electricity may be thought of as resembling a non-compressible, weightless fluid which permeates all space.

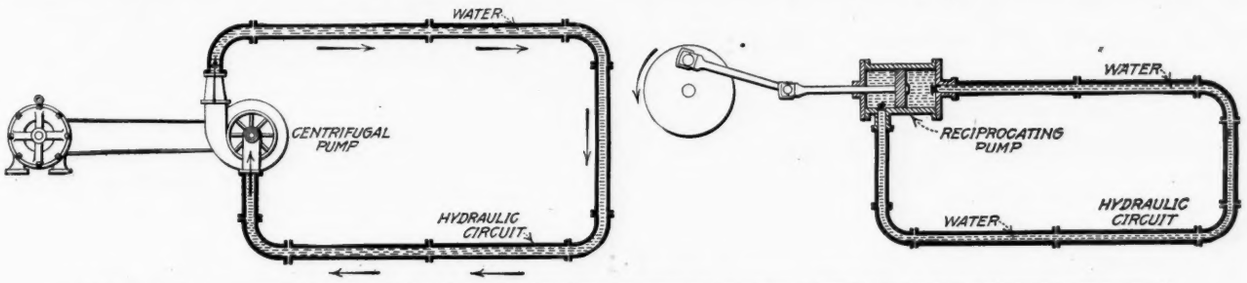
Ohm's law states the relation between current, resistance and e.m.f. It is merely a restatement, as applied to electric circuits, of the general law which governs all physical phenomena: The result produced is directly proportional to the effort and inversely proportional to the opposition. In an electric circuit the current established is the result. The e.m.f. which establishes it is the effort and the opposition is represented by the resistance. Thus it may be written for an electric circuit:

$$I = \frac{E}{R} \quad \text{(amperes)} \tag{1}$$

$$R = \frac{E}{I} \quad \text{(ohms)} \tag{2}$$

$$E = I \times R \quad \text{(volts)} \tag{3}$$

Here I = current in amperes which flows in the circuit or in the portion of the circuit under consideration; R = the resistance of the circuit or the portion of the circuit under consideration in ohms; E = the e.m.f. in volts across the circuit or the portion of the circuit under consideration.



FIGS. 3 AND 4. HYDRAULIC ANALOGY TO DIRECT-CURRENT (LEFT) AND TO ALTERNATING-CURRENT (RIGHT) GENERATOR AND CIRCUIT

Ohm's law may be applied to an entire circuit or to a portion of a circuit. When applied to an entire circuit the amperes in the entire circuit equals the volts across the entire circuit divided by the resistance of the entire circuit. When applied to a portion of the circuit the current in that portion of the circuit equals the voltage across that portion divided by the resistance of that portion.

Electric currents may be divided into two general classes: (1) direct currents and (2) alternating currents. A direct current is one which flows always in the same direction. A direct electric current is analogous to the hydraulic current which would be produced in a pipe circuit (Fig. 3) by a centrifugal pump which causes the fluid to flow always the same way. An alternating current is one the direction of which is reversed at regular intervals. An alternating electric current is analogous to an alternating fluid current which would be circulated in a hydraulic circuit (Fig. 4) by a reciprocating pulsator.

Further classifications of direct currents are: (1)

Continuous currents—which are steady, non-pulsating direct currents, (2) constant currents—which continue to flow for some time in the same direction and with unvarying intensity and (3) pulsating currents—which are regularly varying continuous currents.

The electrical resistance of a conductor is determined by various factors. Thus the resistance of any conductor will vary with: (a) The material of the conductor, (b) directly as the length of the conductor, (c) inversely as the area of the conductor and (d) the temperature of the conductor. That is, the properties of a conductor, which determine the opposition which it offers to the flow of an electric current (electrons)

TABLE I. PROPERTIES DETERMINING FLOW OF CURRENT IN HYDRAULIC AND ELECTRIC CIRCUITS

	Of Water Current Through a Pipe	Of Electric Current Through a Wire
1	Diameter of pipe	Diameter of wire
2	Length of pipe	Length of wire
3	Material of pipe or its internal smoothness	Material and temperature of wire

through it, are (see Table I) somewhat analogous to those which determine the flow of fluid currents in hydraulic circuits.

The circular mil (circ.mil) (Fig. 5) is the area of a circle $\frac{1}{1000}$ in. in diameter. The areas of electric conductors are usually measured in circ.mils. The

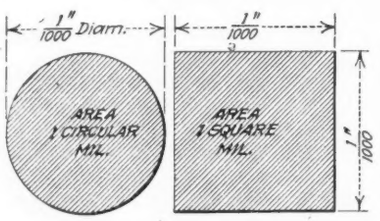


FIG. 5. SQUARE MIL AND CIRCULAR MIL

area of any circle can be expressed in circ.mils by squaring its diameter expressed in thousandths of an inch.

Thus, since $\frac{3}{8}$ in. = 0.375 in., the area of a circle $\frac{3}{8}$ in. in diameter would be $375 \times 375 = 140{,}625$ circ.mils. The area of a circle 0.005 in. in diameter would be $5 \times 5 = 25$ circ. mils.

The square mil (sq.mil) (Fig. 5) is the area of a square having sides $\frac{1}{1000}$ in. long. Areas of rectangular conductors are sometimes measured in square mils. Areas in square mils are obtained by multiplying

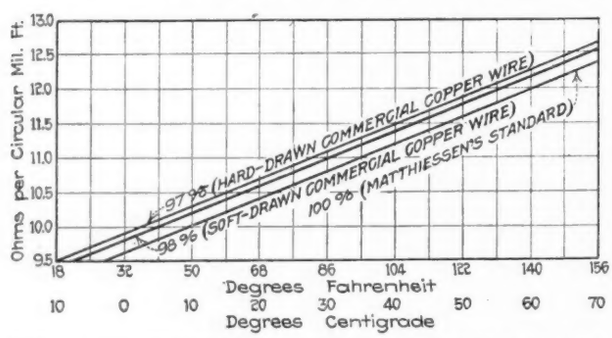


FIG. 6. GRAPHS SHOWING THE RESISTANCE PER CIRCULAR MIL-FOOT OF COPPER OF DIFFERENT CONDUCTIVITIES AT DIFFERENT TEMPERATURES

It is usual to specify that soft-drawn copper shall have 98 per cent. conductivity and hard-drawn copper 97 per cent. Hence, commercial copper wire has about these conductivities

together the length and breadth of the rectangle expressed in thousandths of an inch.

Thus, the area of a rectangle $\frac{1}{2}$ in. wide and 2 in. long would be $500 \times 2000 = 1{,}000{,}000$ square mils.

To reduce square mils or square inches to circular mils or the reverse the following equations may be used: Square mils = circ.mils times 0.7854; circ.mils = square mils divided by 0.7854; circ.mils = square inches divided by 0.0000007854; sq.in. = circ.mils times 0.0000007854.

The circular mil-foot (circ.mil-ft.) is the unit conductor. A wire having a sectional area of 1 circ.mil and a length of 1 ft. is a circular mil-foot of conductor.

Resistivity is specific resistance which may be expressed in ohms per unit volume; for example, re-

TABLE II. APPROXIMATE RESISTIVITIES—SPECIFIC AND RELATIVE—OF CONDUCTORS*

Conductor	Resistivity = p (Resistance of 1 Circ. Mil-Ft. in Ohms) 0 Deg. C. or 32 Deg. F.	23.8 Deg. C. or 75 Deg. F.	Relative Conductivity (As Compared with Copper)	Relative Resistivity (As Compared with Copper)
Silver, pure annealed	8.831	9.674	108.60	0.925
Copper, annealed	9.590	10.505	100.00	1.000
Copper, hard-drawn	9.810	10.745	97.80	1.022
Aluminum (97.5 per cent. pure)	16.031	17.699	59.80	1.672
Zinc (very pure)	34.595	37.957	27.72	3.608
Iron wire	58.702	65.190	16.20	6.173
Nickel	74.128	85.138	12.94	7.726
Steel (wire)	81.179	90.150	11.60	8.621
Brass	43.310	.....	22.15	4.515
Phosphor-bronze	51.005	.....	18.80	5.319
German silver	127.800	.....	7.50	17.300
Gray cast iron	684.000	.....	.....	.....

* International Textbook Co.'s "Electrical Engineer's Handbook." See Croft's "American Electricians' Handbook" for more complete table.

sistivity may be expressed in ohms per centimeter cube or ohms per inch cube. However, it is usually most convenient, in practical work, to express and deal with resistivities in ohms per circ.mil-ft. (Refer to Table II). For practical purposes the resistivity of commercial copper wire (Fig. 6) at ordinary temperatures may be taken as 11 ohms per circ.mil-ft.

Conservation of First-Aid Supplies

A great many of the mines keep a supply of first-aid material on each level of the mine, such as triangular bandages, compresses, roller bandages, adhesive tape, iodine, etc. These supplies are placed on the different levels for the sole purpose of rendering first-aid to the injured. They are usually kept under lock and key, but in many instances the locks are broken and the supplies are taken out and used for various purposes.

The triangular bandages are often used to wrap broken hose or for "sweat rags," the adhesive tape to wrap broken hammer handles or the bottom of carbide lamps. This is a gross injustice to the company, which spends thousands of dollars annually for first-aid material. We can leave the company out of it entirely and say it is a gross injustice to the man himself. He cannot tell when he is going to need some of those supplies for a personal injury, and the bandage which should be on his head or arm may be on his air hose.

A hose cut with a rock may be repaired on top and made as good as new, but an arm cut with a rock and not given proper first-aid treatment is often lost. Let us get together and conserve the first-aid supplies and use them for the purpose for which they were intended. They are hard to get now, because Uncle Sam needs them for the boys "over there."—*Anode.*

Increasing Coal Mine Efficiency—II

BY CHARLES E. STUART
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SYNOPSIS—*In a general way, cutting machines are quite similar in their power requirements to locomotives. The proper means and speeds for driving mine fans as well as properly maintained air courses sometimes result in enormous economies in power. Fluctuating loads on the mine generating station or substation should be avoided as far as possible. This is often much more nearly possible than many operators believe.*

III—An Analysis of Performance of Cutting Machines

THE general considerations which govern the utilization of a mine locomotive, in order that maximum efficiency may be obtained, apply in a similar manner to the cutting machine. There are, broadly speaking, the same elements of avoidable and unavoidable loss of time. There is also the need of so developing the mine that the cutting machine can be used at its rated capacity. Bad power conditions and inefficient handling are factors to the same degree, as in the case of the locomotive, and there is the same loss in productive effort.

The ideal method of working a cutting machine is to give one machine a section containing sufficient places to enable the machine runners to cut each place every other day, letting the loaders clean up in the same manner. If this be done, the machine runners usually stay on one entry and go into the rooms consecutively instead of running all over the mine to cut a place here and another there, thus consuming more time in tramming than in cutting.

In some of the large mines in Pennsylvania and Illinois these ideal cutting conditions are very nearly attained. In one case with which I am familiar, the depth of the undercut has been proportioned to the width of the room and the height of the coal, in order to give just enough coal for the loaders to clean up in one or two full days. This enables the maximum effort to be put forth by the loader and machine runner.

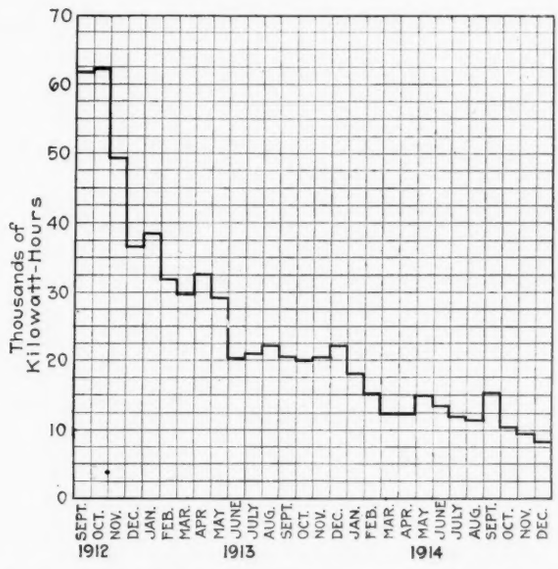

FIG. 6. RESULT OF IMPROVEMENTS IN VENTILATION ON POWER CONSUMED

TABLE II. RECORD TAKEN THROUGH A PERIOD OF 31 DAYS, USING A SULLIVAN SHORTWALL CONTINUOUS CUTTER

September 3 to October 12, 1917

Date	Total Places	Rooms	Width, Ft.	Headings	Width, Ft.	Narrow Places	Width, Ft.	Total Face, Ft.	Average Cut, Depth, In.	Total Hours Worked	Time Waiting for Places, Etc., Hr. & Min.	Actual Hours Work	Time per Place, Min.	Height of Coal, Ft.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sept.														
3	5	..	..	3	14	2	14	70	84	10:00	6:40	3:20	40.0	5½
4	5	2	24	2	14	1	14	90	82	10:00	6:20	3:40	44.0	5½
6	9	2	24	3	14	4	14	146	81[2]	10:45	6:10	5:35	37.2	5 to 6
8	2	2	12	..	..	..	..	24	83	4:15	3:30	0:45	22.1	5½
11	9	2	24	5	24	2	14	196	85	3:45	1:05	4:40	31.1	5½
12	9	3	28	4	14	2	14	168	84	6:45	1:45	5:00	33.3	5½
13	12	6	24	5	14	1	14	228	80	8:00	1:60	6:10	30.1	5½
14	12	7	25.6	4	14	1	14	250	84	10:00	3:50	6:10	30.1	5½
15	11	6	24	3	14	2	35	266	84	6:30	1:00	5:30	30.0	5½
17	10	10	25	..	..	..	..	250	83	6:20	1:05	5:15	31.0	5 to 6
18	8	4	31.5	4	14	..	..	182	81	8:00	3:00	5:00	37.4	5½
19	9	6	26.3	3	14	..	..	200	82[2]	10:30	5:30	5:00	33.3	5 to 6
20	5	4	24	1	14	..	..	110	84	8:00	0:30	2:30	30.0	5½
21	15	8	24	7	14	..	..	290	84	7:45	0:45	7:00	28.0	5 to 6
23	9	8	24	1	14	..	..	206	85	5:45	0:45	5:00	33.3	5 to 6
24	10	7	24	3	14	..	..	210	83	5:00	1:00	4:00	24.0	5 to 6
25	12	11	31.5	1	14	..	..	360	83	8:00	1:05	6:55	34.7	5 to 6
26	14	4	24	5	14	5	20.8	270	81	7:30	1:00	6:30	27.12	5 to 6
27	9	7	22.5	2	14	..	..	186	86	10:50	5:35	5:15	35.0	5 to 6
28	6	2	29	3	14	1	16	116	80	10:00	7:35	2:25	24.1	5 to 6
29	13	10	24	1	14	2	14	282	84	6:30	0:45	5:45	26.7	5 to 6
Oct.														
1	19	13	24	..	..	6	14	395	83	9:00	1:05	7:35	25.0	5 to 6
2	10	7	24	2	14	1	14	207	82	7:00	2:30	4:30	25.0	5 to 6
3	18	11	24	7	14	1	14	376	84	9:30	1:10	8:20	27.14	5 to 6
4	7	8	24	1	14	1	16	150	84	3:45	0:40	3:05	35.0	5 to 6
5	12	8	24	2	14	2	14	248	81	6:35	0:55	5:40	28.4	5 to 6
6	5	3	24	2	14	..	..	100	86	4:30	1:30	3:00	36.0	5 to 6
8	21	9	24	11	14	1	14	284	84	10:00	1:25	8:35	24.11	5 to 6
9	13	9	15.8	2	14	2	14	198	83	7:30	0:35	6:35	30.5	5 to 6
10	13	6	24	4	14	3	14	242	85	8:00	1:45	6:15	28.11	5 to 6
11	5	3	24	2	14	..	..	100	84	4:00	1:30	2:30	30.0	5 to 6
31	317	184	24.2	93	14.3	40	15.6	6,391	83.26	231:00	73:10	157:50	29.87 Min.	66 in.

Table II shows a record taken through a period of 31 days, using the Sullivan shortwall continuous cutter. During this time 317 places were cut, or an average of 10.22 places per day. Column 12, headed "Time Lost Waiting for Places," shows that 73 hours 10 minutes were lost. The runner's report shows that probably 75 per cent. of this delay could have been avoided.

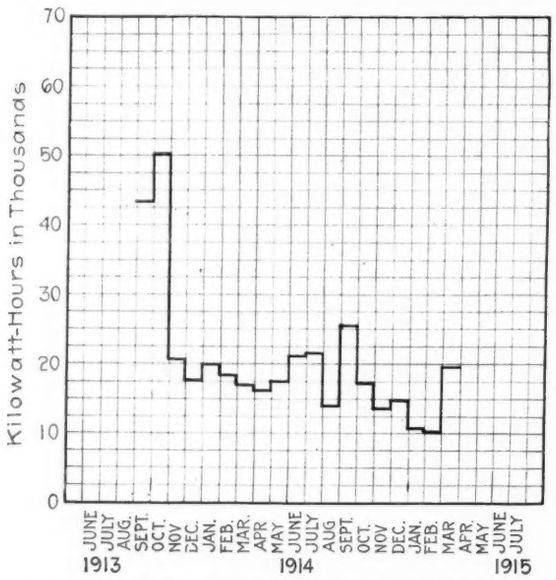

FIG. 7. POWER CONSUMPTION OF A MINE FAN

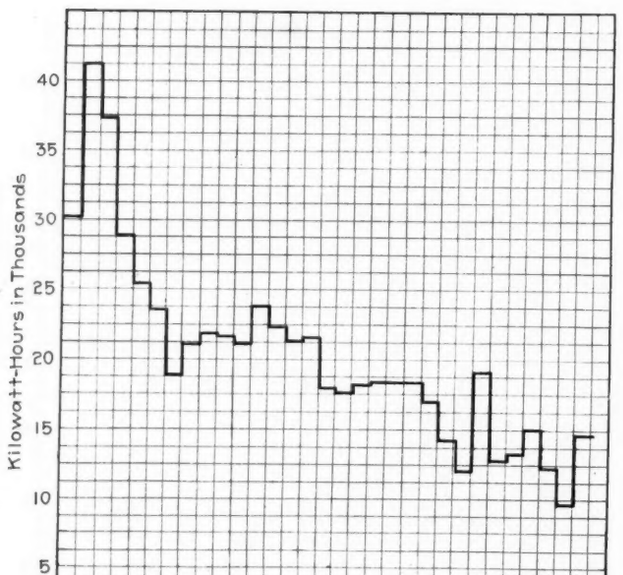

FIG. 8. POWER CONSUMPTION OF A MINE FAN, SHOWING RESULT OF VENTILATION IMPROVEMENTS

These delays were designated as arising from such causes as "blocked by motor," "no more places cleaned up," "off the track," etc. Since the average time consumed in cutting a place was a little less than 30 minutes, it is probable that 100 additional places could have been cut if these delays had not occurred, making a total of 417 places, or an average of about 13 places per day. The average noted in Table II is above the usual. There are cases where runners have cut from 17 to 22 places in 10 hours, these being, however, record runs.

Table III represents tests of power consumption of Sullivan room-and-pillar machines, with a 6-ft. 6-in. and 10-ft. 4-in. cutter-bars. It also gives the comparative economies of machines. There is no information contained in these tables which would not be of interest and value as determined at every property using a cutting machine. These tests and supplementary observations develop the following facts: The first cost of the machines is practically the same. Repairs on the longer bar machines are less than those on the shorter machines; they are heavier throughout and have fewer parts relatively. Experienced men can cut as many

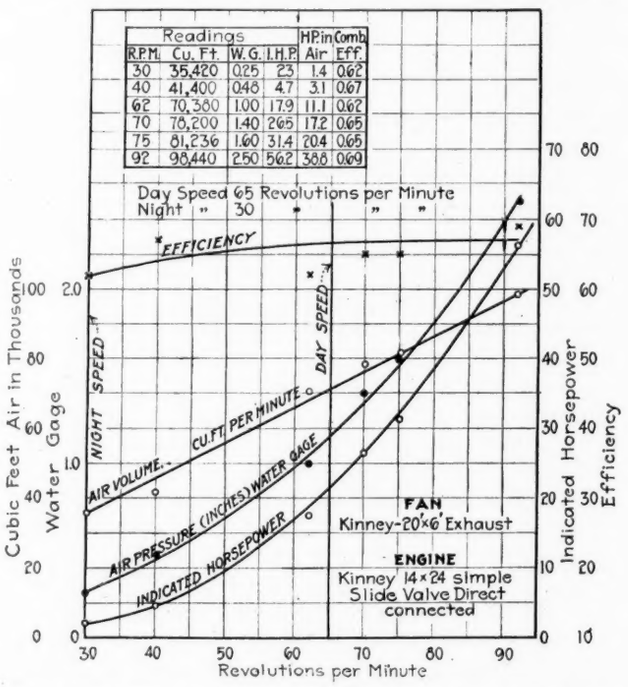
Readings
R.P.M. Cu. Ft. W.G. I.H.P. HP.in Air Comb Eff.
30 35,420 0.25 2.3 1.4 0.62
40 41,400 0.48 4.7 3.1 0.67
62 70,380 1.00 17.9 11.1 0.62
70 78,200 1.40 26.5 17.2 0.65
75 81,236 1.60 31.4 20.4 0.65
92 98,440 2.50 56.2 38.8 0.69
Day Speed 65 Revolutions per Minute
Night " 30 " " "
EFFICIENCY
NIGHT SPEED
DAY SPEED
AIR VOLUME.- CU.FT. PER MINUTE
AIR PRESSURE (INCHES) WATER GAGE
INDICATED HORSEPOWER
FAN
Kinney-20'x6' Exhaust
ENGINE
Kinney 14x24 simple Slide Valve Direct connected
Cubic Feet Air in Thousands
Water Gage
Indicated Horsepower
Efficiency
Revolutions per Minute

FIG. 9. POWER REQUIRED BY STEAM-DRIVEN MINE FAN

places with the long bar machines as with the short bar machines if voltage is maintained. Loaders after the long bar machines use less powder per ton of coal, as the same total amount of powder is used per place.

IV—Power Demand and Consumption of Mine Fans

Figs. 6, 7 and 8 show the results of alterations made with the object of reducing power consumption and power demand of mine fans. These alterations were preceded by investigations and tests which developed the following facts: (1) The fans were handling an amount of air in excess of the requirements of the mine; (2) large proportions of this air failed to reach the working faces, due to leakage, defective stoppings, brattices and similar reasons; (3) the air pressure, as shown by the water gage, was unduly high, owing to the air current being carried in too few splits.

These conditions were corrected by carrying to the faces the full amount of air required for good ventilation and by reducing the speed of the air current. Stoppings were repaired, and stone was substituted for timber in their construction. The speed of the air

TABLE III. TESTS OF POWER CONSUMPTION OF SULLIVAN ROOM-AND-PILLAR MACHINE WITH 6 FT. 6 IN., AND 10 FT. 4 IN. CUTTER-BARS AND COMPARATIVE ECONOMY OF MACHINES

Power Consumption of 6 ft. 6 in. Sullivan Mining Machine—No. 10 Mine—No. 3 Seam

1913 Date	No. Pics. Cut	Watt Hours per Square Foot Undercut																											
		Unloading			Placing			Sumping			Cutting			Pulling Out			Loading			Power in Place			Trolleying			Total Aver. Power		Dimensions			
		Min.	Max.	Aver.	Min.	Max.	Aver.	Min.	Max.	Aver.	Min.	Max.	Aver.	Min.	Max.	Aver.	Min.	Max.	Aver.	Min.	Max.	Aver.	Aver. Dist.	Aver. Power	Aver. Power Per Sq.Ft. Under-cut	Per Place	Per Sq.Ft. Under-cut	Width of Cut	Depth of Cut	Sq.Ft. Under-Cut	Height of Coal, Ft.
7/7	6	0.1515	0.555	0.255	0.0833	1.53	0.5645	2.5	5.13	3.195	14.5	21.37	16.97	0.77	1.667	1.042	0.357	1.39	0.83	19.4	29.6	24.8	794	167	1.778	2,402	25.6	15.6	6.0	94	....
7/8	7	0.1515	0.512	0.344	0.256	1.515	0.281	1.363	5.0	2.4	11.07	17.41	14.5	0.53	1.791	0.875	0.303	2.12	0.74	14.78	25.42	19.1	665	139	1.447	1,969	20.5	16.3	5.3	96	....
Total, Aver.,	13	....	....	3.938	....	....	5.354	....	....	35.97	....	203.32	203.32	....	....	12.377	....	....	10.16	....	....	282.5	9,419	1,975	20.797	28,197	297.1	208.0	73.0	1,236	....
		....	....	0.3025	....	....	0.4127	....	....	2.765	....	....	15.62	....	....	0.95	....	....	0.78	....	....	21.75	724	152	1.598	2,170	22.84	16.0	5.61	95	....
Power consumption of 10 ft., 4 in., Sullivan Mining Machine.—No. 11 Mine—No. 3 Seam.																													
6/25	3	0.05	0.263	0.1295	....	....	....	1.32	2.32	2.14	14.0	21.0	18.0	0.526	3.75	1.673	0.10	0.158	0.119	18.63	24.45	22.0	787	404	2.095	4,659	24.2	19.6	9.8	192	6½
6/27	4	0.117	0.25	0.173	....	....	....	3.385	5.35	3.76	16.3	18.9	17.5	0.555	1.43	0.809	0.175	0.715	0.422	20.8	24.8	22.8	758	388	2.24	4,333	25.0	17.5	9.87	173	6½
6/28	2	....	0.597	0.23	0.2895	0.513	0.382	3.87	8.45	5.67	16.2	21.15	18.2	0.474	1.24	0.73	....	0.685	0.263	21.22	31.9	25.5	860	440	3.895	4,320	28.5	16.0	9.5	152	6½
6/30	5	0.192	0.429	0.314	0.321	1.0	0.657	8.75	4.51	11.76	23.6	15.7	0.143	1.39	1.357	0.486	0.35	15.85	34.6	22.6	650	333	2.36	3,420	25.0	14.0	9.8	137	6½
7/1	2	0.294	0.389	0.343	0.222	0.235	0.228	2.39	4.0	3.14	13.45	19.3	16.3	0.294	0.667	0.485	0.1177	0.222	0.1712	17.1	24.2	20.6	600	307	1.75	3,907	22.3	17.5	10.0	175	6½
Total, Aver.,	....	....	....	3.796	....	....	4.505	....	....	61.63	....	....	274.5	....	....	17.47	....	....	4.665	....	....	362.4	12,263	....	38.325	128,063	400.2	265.8	147.8	2,610	....
	....	....	....	0.237	....	....	0.282	....	....	3.855	....	....	17.17	....	....	1.09	....	....	0.292	....	....	22.65	766	....	2.39	4,054	25.05	16.6	9.24	163	6½

COMPARATIVE ECONOMY IN COAL OF SAME THICKNESS:

Average width of place (wide and narrow), 16 ft.
Average depth of cut 6 ft. 6 in. bar, 5.61 ft. of 10 ft. 4 in. bar, 9.24 ft.
Number of square feet undercut per place with 6 ft. 6 in. bar, 89.8 sq.ft.; with 10 ft. 4 in. bar, 147.8 sq.ft.

Power per place @ 1½c. per kw. hr. with 6 ft. 6 in. bar, $\frac{22.8 \times 89.8 \times 1.5c.}{1000}$ = 3.1c.; with 10 ft. 4 in. bar = $\frac{25.1 \times 147.0 \times 1.5c.}{1000}$ = 5.6c.

Labor per place		100.0
Total cost per place, labor and power		103.1
Total cost per square foot undercut, labor and power		1.15c.
Saving by 10 ft. 4 in. bars		31 per cent.
For rooms with two tracks, 36 ft. wide		
Number square feet undercut (same depths as above)	202.0 sq.ft.	332.6 sq.ft.
Power per place @ 1½c. per kw.-hr.	$\frac{22.8 \times 202 \times 1.5c.}{1000}$ = 6.9c.	$\frac{25.1 \times 332.6 \times 1.5c.}{1000}$ = 12.5c.
Labor per place	125.0	128.0
Total cost per place, labor and power	131.9c.	140.5c.
Total cost per sq.ft. undercut	0.65c.	0.42c.
Saving by 10 ft. 4 in. bars	35.4 per cent	

First cost of machines is practically the same; repairs on longer bar machine will be less than on shorter machine, as it is heavier throughout, and has fewer parts, relatively; experienced men can cut as many places with longer bars as with shorter ones, if voltage is maintained, and, in addition to above, loaders use less powder per car, as same total amount of powder is used per place.

current was reduced by: (a) Institution of added splits; (b) cleaning up falls of slate in the courses and tunnels; (c) by the use of additional air courses where possible.

The fans are now run at the speed required to obtain the quantity of air needed under corrected conditions. At night, on Sundays and holidays, half the amount of air is handled. In order to give the full amount of air for the remaining periods, two-speed motors were installed. In one case a change was made from steam to electric drive. Records show that while the steam drive was in use, the power consumption amounted to the equivalent of 4¼ kw.-hr. for every ton of coal mined. A constant-speed motor, when installed, cut the consumption of power for each ton of coal to 2½ kw.-hr., making a 70 per cent. saving by installing this one-speed motor. After about four months' service, a two-speed motor was installed and the fan was run at full speed during the operative period of the day, and at half speed at other times. The amount of power for each ton of coal then dropped to 6 kw.-hr., securing a 310 per cent. saving over the one-speed motor and a 600 per cent. saving over the steam drive.

I might emphasize that these data were compiled at a property which first used power manufactured at its own central station. Later it purchased power. The cost of these and other elaborate investigations, the results of which have made this property famous throughout the country for its efficient methods, represents a negligible fraction of the economies produced.

Figs. 9 and 10 show tests made on engine-driven mine fans in the Pocahontas coal fields. There is developed together with other information the horsepower required at different speeds and for different air volumes. These curves should be carefully considered in conjunction with Figs. 6, 7 and 8. The latter, as previously stated, show what may be done by proper investigation and adjustment.

V—Analysis of Power Demand and Consumption in Relationship to Capacity and Production

The demand on the generating plant of a coal mine or on the substation in cases where power is purchased is of a sharply fluctuating character. Fig. 11 shows the reading of a graphic meter taken at a 200-kw. substation. The extreme peaks are the result of short bad grades. The mine locomotive, when encountering these grades, momentarily

Fan, 14' Jeffery Exhausting
Engine, 17"x18" Chandler and Taylor

READINGS					
SPEED-R.P.M.	WATER GAGE	CU. FT. AIR PER MIN.	I.H.P.	H.P. IN AIR	COMB. EFF. %
60	0.5	71,500	12.8	5.6	0.44
80	0.9	104,000	22.8	14.7	0.65
90	1.2	*117,500	28.8	*19.3	*0.67
100	1.4	*132,500	36.8	*25.9	*0.71
104	1.5	137,000	45.0	32.4	0.72

*Estimated from Curve

Normal Operation, Day-10 Hrs. at 95 R.P.M. Night and Holidays-8 Hrs. at 65 R.P.M.

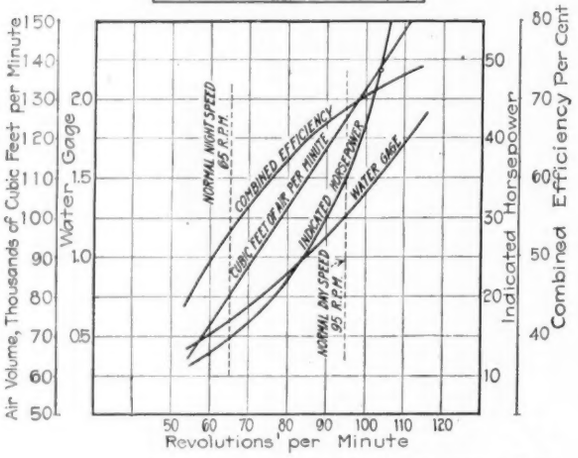

FIG. 10. CURVES OF A STEAM-DRIVEN MINE FAN

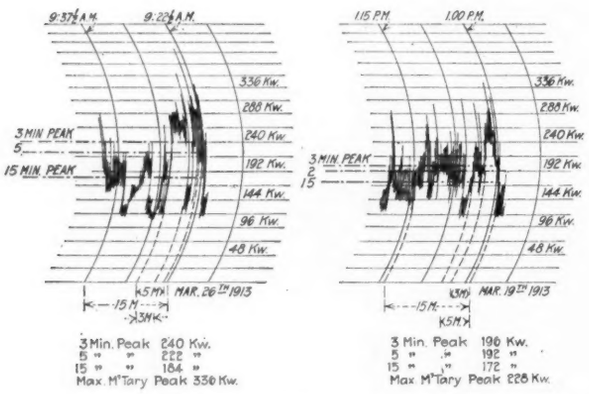

FIG. 11. DEMAND CURVES ON A 200-KW. PLANT

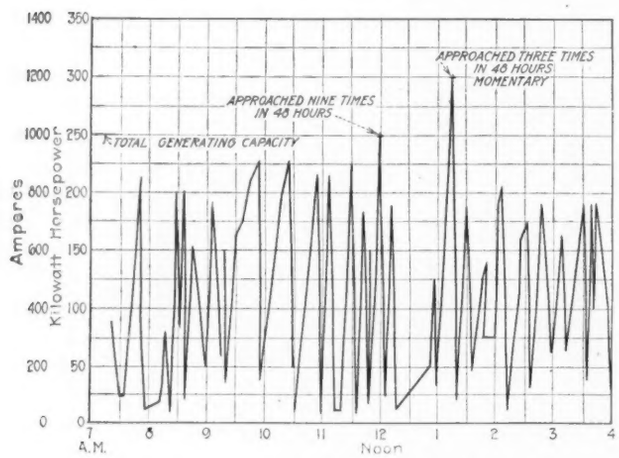

FIG. 12. ANALYSIS OF A MINE LOAD

loads up the station. Few mines are above criticism in this respect. With a large percentage of mines the load on the generating or converting station is largely composed of more or less avoidable demands.

Moreover, to an extent that is rarely appreciated, such conditions create a "bottle neck" to the entire haulage system. Thus a 10-ton mine locomotive on

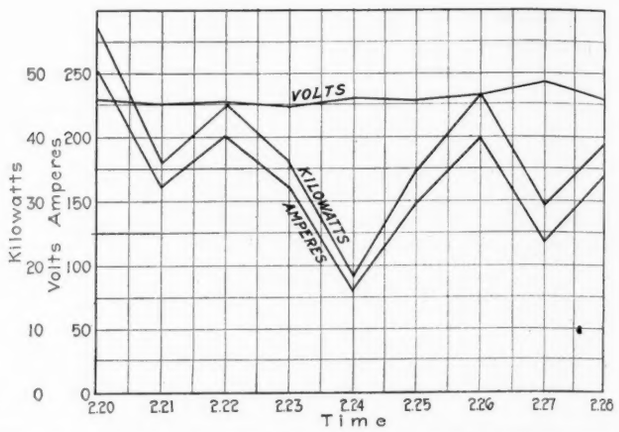

FIG. 13. POWER CONSUMED BY AN 80-HP. LOCOMOTIVE, PULLING 20 EMPTIES

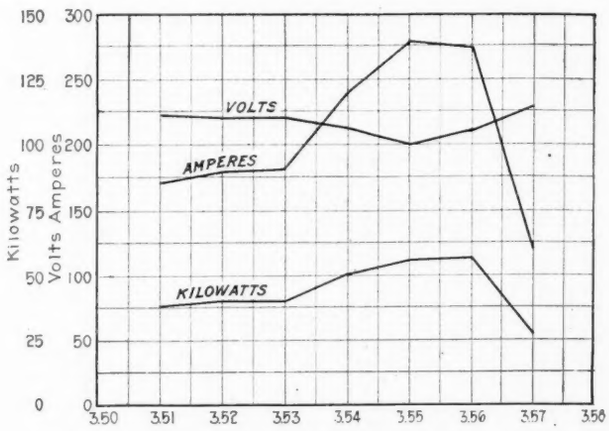

FIG. 14. POWER CONSUMED BY AN 80-HP. HOIST, PULLING 12 LOADED CARS

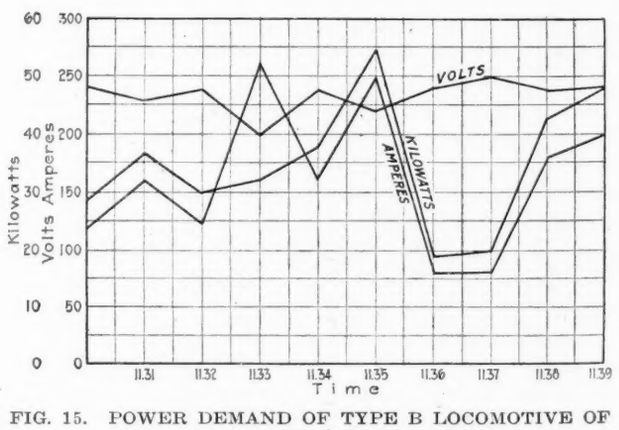

FIG. 15. POWER DEMAND OF TYPE B LOCOMOTIVE OF 80-HP., HAULING 6 LOADED CARS

level track should haul 31 loaded cars of 4 tons each. The same locomotive on a 6 per cent. grade will haul eight 4-ton cars, thus showing a decrease of 281 per cent.

It will be seen that the grades may be the determining factor in the number and weight of locomotives required, the capacity of the generating station or substation; also as to the weight of rails, the power demand and the power consumption.

Fig. 12 shows the analysis of a load as observed between the hours of 7 a.m. and 4 p.m. From the chart the plant seems to be as well loaded as is conservative. It was, however, desired to add to the load as shown a hoist demanding 150 kw. at full load, or

an additional 600 amp. In order to determine whether the generating plant could take care of such an additional demand, a test was run on those loads, which were the factors for consideration.

Figs. 13, 14, 15 and 16 show the demands of the locomotive and hoist on different dips. Adding the hoist load in this instance simply necessitated preventing the maximum demands of the locomotives occurring simultaneously. Where grades could not be reduced or avoided, there were two practical methods available to flatten the haulage demand; one, that of a simple signal-

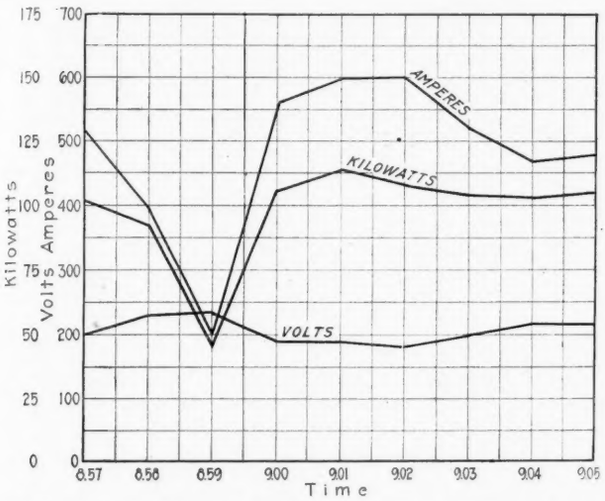

FIG. 16. POWER CONSUMED BY 2-F LOCOMOTIVES OF 200-HP., HAULING 14 CARS

ing device which would indicate trips on grade; the other roughly scheduling the main haulage locomotives.

The majority of mines on careful examination and test from an electrical and mechanical standpoint will develop the following facts: (1) By systematizing the load, a steam station or substation apparently overloaded with the breaker tripping many times a day, resulting in loss of speed and efficiency, can be operated in a normal manner. (2) Conversely, many stations apparently fully loaded can take on more cutting machines or locomotives without addition to either substation or steam station, as the case may be.

Table IV, showing a monthly analysis of power consumption, was made with the instruments belonging to the mine investigated. The cost of the instruments necessary to such an analysis is negligible compared with the savings which have resulted from their use.

It is characteristic of the mine as of the factory that

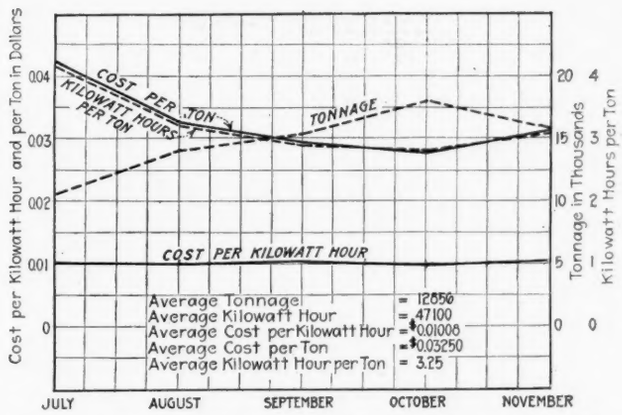

FIG. 17. OUTPUT, CONSUMPTION, COST PER TON AND PER KILOWATT-HOUR OVER 5 MONTHS

there is more or less idle machine operation. This is particularly true where a mine is equipped with more than one converting or generating set. It is, moreover, generally appreciated that machinery is operating at its highest efficiency when approximately fully loaded. While the characteristics of power demand in a mine make full load operation of most of the equipment out of the question, at the same time through analyses such as the foregoing, and through systematizing, the power consumption and demand of many mines have shown marked reduction. This in turn has been reflected to a valuable extent on the cost sheet.

There is a psychological aspect to this as in many other cases of economies produced and demonstrated.

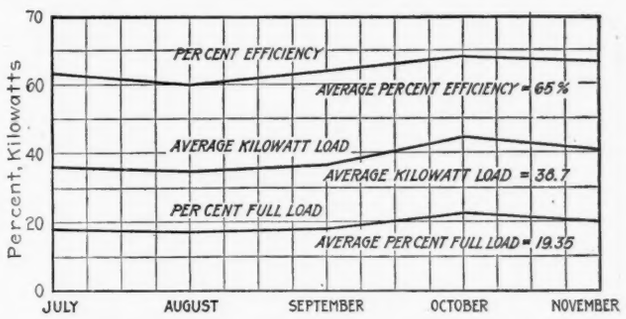

FIG. 18. RATIO OF AVERAGE CONSUMPTION TO FULL LOAD CAPACITY

An organization trained to give thought to such points will invariably give thought to other possibilities for reducing costs and for increasing the efficiency of operation.

Figs. 17, 18 and 19 develop graphically important facts

TABLE IV. MONTHLY ANALYSIS OF POWER CONSUMPTION

(Alternating Current Power Consumption, Kilowatt-Hours)

	Town Lighting	Town Pump	Substation Lighting	Shop Lighting	Tipple Lighting	Barn Lighting	Shop Power	Supply House	Rock Hoist	Car Haul	A.-C. Line Losses	Conversion Losses	M.G. Set Efficiency	D.-C. Meter	Total
July	2,225	528	31	10	..	..	260	..	530	290	250	14,906	63.0	25,570	44,600
August	1,925	1,548	21	17	..	..	280	..	610	280	250	16,499	60.0	24,670	46,100
September	2,400	.....	20	32	..	..	320	..	600	350	250	15,068	64.0	26,660	45,700
October	2,550	.....	5	27	12	2	290	..	830	470	200	13,694	70.5	32,620	50,700
November	2,750	.....	8	60	7	2	300	4	860	450	200	14,329	67.7	29,430	48,400

(Direct Current Power Consumption, Kilowatt-Hours)

	Pneumelectric Machines	Chain Machines	Mine Pumps	Town Pump	Booster Fans	Robinson Fan	Mine Office	Stone Crusher	Cutting Props	Haulage	Total
July	230	3,180	9,971	922	605	4,192	3	560	...	6,417	19,153
August	202	4,138	5,681	1,219	490	4,695	3	560	230	7,454	24,670
September	403	4,280	7,020	1,041	506	4,800	3	...	...	8,607	26,660
October	385	7,216	7,846	896	498	4,718	5	...	...	10,056	32,620
November	736	5,904	7,149	1,054	450	4,365	7	...	...	9,765	29,430

concerning the power requirements of a mine. Fig. 17 gives the tonnage output monthly of the mine investigated through a period of five months. There is shown also the monthly kilowatt-hour consumption, the monthly cost per kilowatt-hour, the monthly cost per ton and the kilowatt-hour consumption per ton. The increased or decreased cost of power corresponding to variation of production is also indicated.

Fig. 18 shows the ratio of the average power consumption to the full load capacity of the substation. It shows also the average hourly kilowatt output of the station. In addition, the efficiency of the station is indicated. This information is provided to correspond to the monthly statement shown in Fig. 17.

It will be observed that the average percentage of load—that is, the load factor of this station, which is

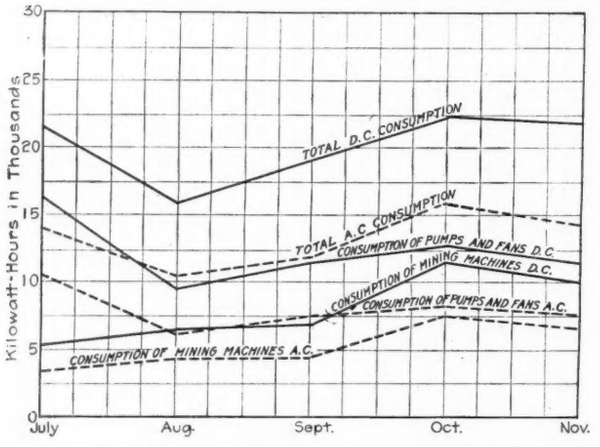

FIG. 19. THE IDEAL CONDITIONS OBTAINABLE THROUGH USE OF ALTERNATING CURRENT

a 200-kw. station—is 19.35 per cent. and that this average corresponds to the average tonnage of 12,856 tons per month.

Fig. 19 shows the ideal condition that can be obtained by using alternating current as far as possible. This figure shows the monthly consumption in kilowatt-hours of inside fans, pumps and mining machines, both on a basis of using alternating-current motors and direct-current motors. It is shown that the saving by using alternating-current motors would average 7233 kw.-hr. per month.

The foregoing is an excellent illustration of where the question is one of applying purchased power, or power from a mine power station generating alternating current. A large proportion of mines when equipping with purchased power continue all of their motor-driven apparatus on a direct-current basis. It can be readily shown, or in fact deduced from the figures used, that where alternating current is available a change-over would result in a decreased cost as incident to decreased power consumption, as well as demand, which would fully justify the change. But most important is the desirability of not loading up the substation with a load that can be more cheaply and reliably carried by stationary transformers.

(To be continued)

Based on the mortality statistics of the allied armies, a soldier's chances are twenty-nine chances of coming home to one chance of being killed.

Coke Making in New South Wales*

An excellent silvery coke from the bituminous coal of the Newcastle (N. S. W.) district has been made for upward of fifty years in beehive coke ovens. One beehive plant was erected in the Southern Coalfield in 1891, at which, by crushing the small coal, a superior hard coke was produced. The large smelting plants at Broken Hill and others formerly imported the whole of their coke supplies from Germany, the north of England, or from South Wales. When the huge deposits of lean copper ores at Mount Lyell (Tasmania) and elsewhere were being developed, proposals to use Australian coke led to the making of practical experiments. These showed that the steam coal of Illawarra, although higher in ash and in fixed carbon than bituminous coal from Newcastle, produced a harder coke, cellular in structure and better adapted to withstand the pressures in large furnaces, while its ash content was not materially higher than in coke from Newcastle. To make one ton of Newcastle coke fully two tons of coal are used, while from 26 to 27 cwt. of southern coal only are required.

Mount Lyell began the erection of ovens at Port Kembla, and soon after the Broken Hill Proprietary erected a larger plant at South Bulli. South Clifton Colliery erected a plant of beehive ovens, and other smelting and private companies have erected large batteries of ovens near the other collieries. The saving in the cost of coke to the Broken Hill company must have been considerable.

It was early found that rectangular ovens handling large quantities of coal, saved time and expense in charging, enabled the coke to be pushed out by electrical or hydraulic pushers or rams, and gave better results than beehive ovens. Careful consideration was given to the adoption of byproduct ovens, but the proposal was abandoned as impractical with southern coal on account of the low yield of tar and ammonium sulphate in the lean coals, the great cost of importing (in part due to the excessive tariff) and erecting byproduct apparatus from Europe, and the additional cost of sending the products to Europe.

A modification of the Welsh or Thomas oven gained favor. The first battery was erected with side and bottom flues measuring 21 x 4 x 5½ ft. Smelting companies erected ovens measuring 30 x 2 ft. 9 in. by 6 ft., with horizontal side and bottom flues. Other firms adopted larger ovens 30 x 6 ft. 8 in. by 6½ ft., and 30 x 8 x 5½ ft., some with vertical flues and some without. All the batteries use slack coal, crushed fine. Eight companies have up to the present erected 602 ovens.

With the exception of the beehive plants all the others use hydraulic, electric or steam pushers and levelers. One employs a Buchanan compressor and charging-box in which the pulverized material is pushed into the oven. This machine also quenches the coke by sprayers. In the majority of the plants a portion of the waste gases is employed to raise steam for use in the coke plant or for the generating plants at the mines.

The numerous difficult conditions imposed by wage boards have considerably increased the already high

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*From a paper by Dr. R. J. N. Robertson, presented at the Nottingham meeting of the Institution of Mining Engineers, Sept. 13, on "Recent Developments in the Coalfields South of Sydney."

cost of labor at the ovens. The excessive overtime imposed for work done between noon on Saturday and Monday morning has necessitated alterations of the usual practice of working ovens continuously, and charges are now adjusted so as to avoid Saturday afternoon or Sunday drawing. It has been found most suitable to burn for 72 hours. The higher temperature required for 24-hour burning necessitates the use of a higher quality of firebrick than has yet been made in Australia, the cost of which from Europe would be prohibitive.

The output of the wider coke ovens is nearly double that of the narrower ones, which, owing to labor restrictions, cannot utilize the advantages inherent in the arrangement of flues that they possess. The coke can be quenched in the wider ovens, and this avoids the dust and heat that largely contribute to the increased cost of labor and other hampering conditions. With the exception of one battery, the various ovens are charged through three or four openings from large larries. The doors are raised and lowered by hydraulic power.

In the year 1892 Newcastle produced 12,262 tons and the Southern district 5595 tons of coke; in 1914 Newcastle produced 28,264 and the Southern district 276,536 tons, which in 1915 was increased to 333,619 tons. A comparative analysis of the cokes produced are given in the following table:

COMPARATIVE ANALYSES OF COKES

From	Moisture, Per Cent	Volatile Hydro-Carbon, Per Cent	Fixed Carbon, Per Cent	Ash, Per Cent	Sulphur, Per Cent	Specific Gravity
Coöperative Colliery, Newcastle	1.87	0.27	88.77	10.45	0.04	1.814
Nuanderra, Southern District	0.21	0.15	87.55	11.50	0.45	1.934
Hoods, South Wales, (B. Hill, Central)	0.36	0.37	88.86	9.70	0.71	2.032
Hamburg, Germany	0.35	0.55	88.58	9.20	1.32	1.831

An Investigation of Concrete Houses

An idea of how some concrete houses are regarded by the occupants is given by Milton Dana Morrill, architect, New York City, in his report of his own personal investigation. The investigation was made prior to a housing enterprise on which Mr. Morrill is now engaged. The group to which Mr. Morrill refers in the portion of his report here quoted was erected under his own direction. [The work has been described in *Coal Age* May 31, 1913, under the title of "Concrete Houses at Lackawanna Mine."—Editor.]

On Nov. 30-Dec. 1, 1917, I inspected a group of 40 reinforced-concrete dwellings at Nanticoke, Penn. These have been occupied for the last four years. The houses contain seven rooms, with outside toilet, no electric or gas lighting. The houses are piped for cold water only. The monthly rental is now $10. The older residents of the group still get their houses for $8, which was the established rental of four years ago. These houses have solid concrete walls, concrete floors, partitions, stairs and flat concrete roofs. The only woodwork is for windows and doors and their frames. The entire structures are of cinder concrete. Steel forms were used throughout the building operation; the marks of these forms show plainly inside and outside the houses, as no plaster or other finish has been applied, the concrete being painted only—except on six of the 40 dwellings, where the interior was finished with a skim white coat of plaster. These form marks give to the work a rough and unfinished appearance, both inside and out. From a structural standpoint, the houses seem to be standing well, with no repairs except a coat of paint since they were completed. The permanency of this construction for industrial houses is here clearly demonstrated, although the finish here given is too crude for the better class of industrial dwelling.

The renter is not particularly interested in the permanency of the house construction; neither does he give any particular value to the fireproof or sanitary quality of his house.

In order to get the tenants' viewpoint after living in these houses for several years, a list of questions was compiled and put to 15 different families in the group.

The questions asked were as follows:

1. How long have you lived in this house?
2. Have you ever seen any dampness in the house?
3. Do you find your house comfortable—warm in winter, cool in summer?
4. How many stoves do you have?
5. How much coal do you burn per month?
6. Do you like the casement or swinging windows?
7. Do you like the combination bathtub and washtubs installed in the kitchen?
8. What covering do you use on the concrete floors?
9. Do you find the floors cold or hard to the feet?

Many Facts Brought Out By Questions

These questions, together with observation, brought out the following facts:

Each seven-room dwelling was heated by the kitchen range and one large stove in the living room, requiring on an average of one ton of coal per month. All the families found the combination washtubs and bathtub a convenient and a useful fixture. Practically all the families would prefer the usual sliding windows instead of those with casement or swinging sash. In all the houses inspected the concrete floors were covered with rugs, in the living rooms, and with linoleum in the kitchens. In some of the answers given there was some variation, so it may be helpful to give these answers in detail. For indentification the facts brought out by the tenants have been put down under the house number where each inquiry was made.

Dwelling No. 303—Four years' occupancy. No dampness, but walls sweat on wash day. House very cool in summer.

No. 309—Four years' occupancy. No dampness. Concrete floors found hard on the feet.

No. 325—Three years' occupancy. Walls sweat on wash day. Rather have wood floors to live on.

No. 315—Had just been vacated and was being washed out before arrival of new tenant. The floors were being flushed with soap and water and scrubbed with a broom. A dwelling of this construction can be cleaned very thoroughly. There are no concealed spaces in the construction to harbor vermin or insects.

No. 326—No dampness found. House found warm in winter, cool in summer.

No. 936—Four years' occupancy. No dampness found. Concrete floors not found cold, but would prefer wood covering.

No. 939—Four years' occupancy. Would prefer wood floors.

No. 921—Four years' occupancy. No dampness found. Even temperature, cool in summer and warm in winter.

No. 923—No dampness observed. Construction preferred having wood floors. Cement floors not found cold, but wood floors preferred—"easier to fasten carpets down."

No. 924—No dampness found, but concrete floor found hard.

No. 934—Walls sweat on wash day. Finds house warm in winter, very cool in summer. States that did not like concrete floors at first, now finds them O. K.

No. 327—One year occupancy. No dampness found. Casement windows preferred. More air in summer. Wood floors preferred.

No. 333—Occupancy one year and three months. Cellar found damp. Finds house cool in summer, about like wood house in winter.

In the six dwellings where the walls were finished with a skim coat of white plaster directly over the concrete

walls, this has given considerable trouble. Steam from washing has loosened this thin plaster coat, and much of it has had to be replaced.

This investigation of these concrete houses would seem to show that cinder or slag concrete, when properly made and reinforced, is a satisfactory construction for the walls of dwellings. It would further show that it is necessary to furr such concrete walls if sweating is to be eliminated. The investigation further shows that to get an attractive and permanent exterior finish these concrete walls should have a stucco finish.

While the concrete floor has many advantages from a permanent fireproof and sanitary point of view, this investigation shows clearly that the tenants much prefer a dwelling with the usual wooden floors.

The permanency of this construction is at once apparent. These houses will require an occasional coat of paint and the doors and windows might after many years have to be replaced, but otherwise there seems to be no reason why these houses should not be as good in 50 or even 100 years as they are to-day.

These houses were designed and built to accommodate the families of the average mine laborer, whereas from the inquiry made they are occupied to a large extent by the families of the mine foremen. These men receive higher wages and could afford to rent and would gladly occupy better finished houses, with modern conveniences, such as electric lights, bathroom and furnace heat, if such houses were available close to their work—*Concrete*, September, 1918.

Percentage of Sizes of Fresh-Mined Anthracite Produced by 12 Leading Producers, 1913-1916

Size	1913	1914	1915	1916
Lump	00.7	00.3	00.3	00.3
Broken	06.7	06.9	06.8	07.4
Egg	12.6	11.9	11.8	12.4
Stove	19.0	20.6	20.9	20.8
Chestnut	24.3	23.2	23.2	22.7
Total	63.3	62.9	63.0	63.6
Pea	12.4	12.8	12.9	12.1
Buckwheat	13.2	13.2	13.4	13.7
Rice	05.7	05.4	05.2	04.3
Barley	03.2	03.4	03.2	02.6
Boiler (birdseye)	02.1	02.2	02.2	03.4
Screenings (silt)	00.1	00.1	00.1	00.3
Total	36.7	37.1	37.0	36.4

Novel Brick and Concrete Work

Some interesting underground construction is being carried on at one of the large mines of the Northwestern Mining and Exchange Co., in Clearfield County, Pennsylvania. The shaft station at the foot of the hoisting shaft is built entirely of brick to a point at which the company thought the roof would support itself. It was found that it would not, and Fig. 1 shows the new steel cap-pieces in place supported by wooden timbers which will shortly be removed and replaced by

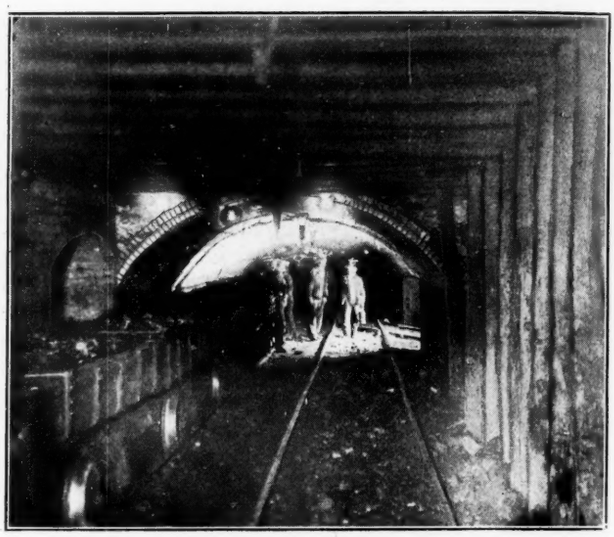


FIG. I. STEEL CAP-PIECES SUPPORTED BY WOODEN TIMBERS

a concrete sidewall. The illustration also shows the brick arch work at the shaft station.

Fig. 2 shows an important junction point in the mine. The tracks in the foreground go to the shaft bottom. The entry from which the cars are coming

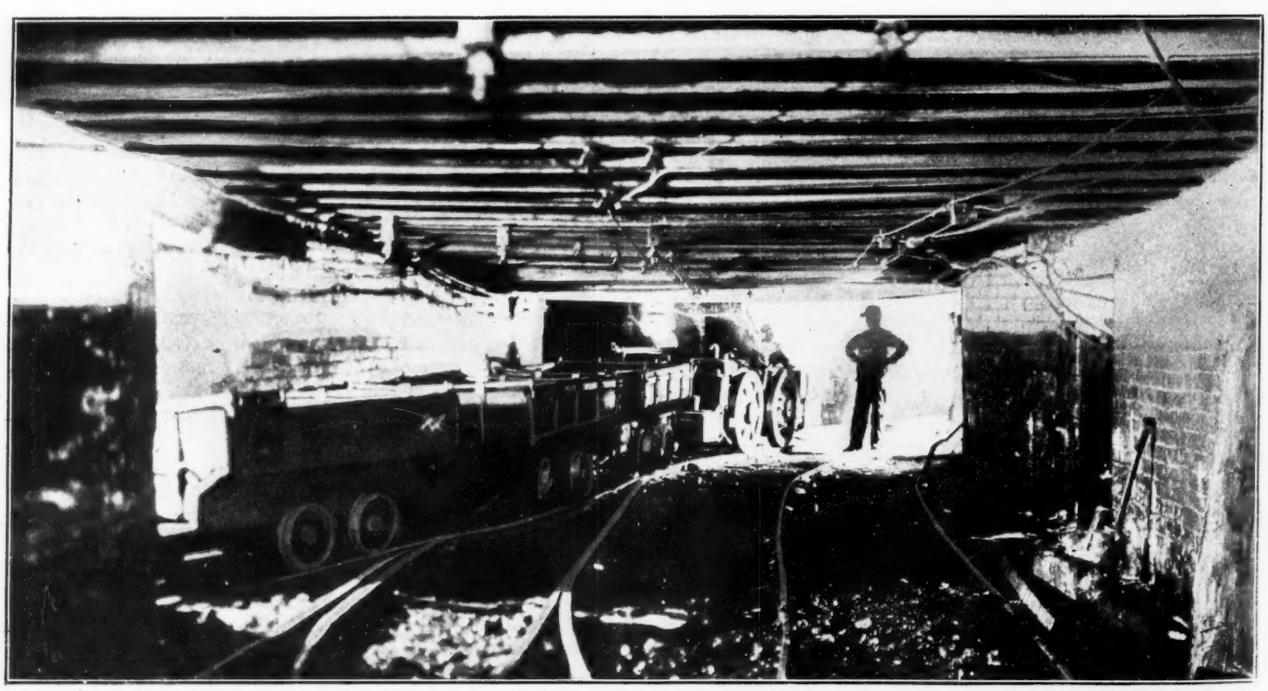


FIG. 2. IMPORTANT JUNCTION POINT IN THE MINE; NOTE BRICK WALLS AND ROOF OF STEEL I-BEAMS

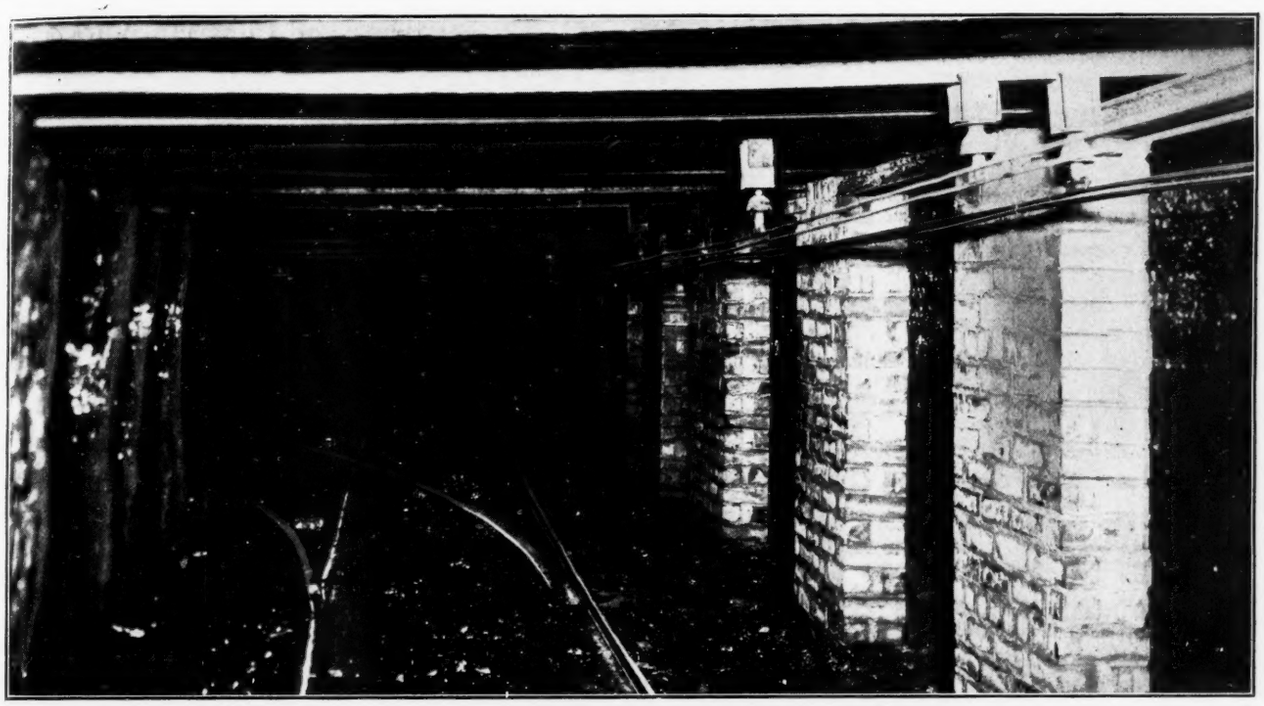


FIG. 3. SHOWING HOW BRICK PIERS COMPARE WITH OLD WOOD TIMBERS

is the empty track, the two entries in the background going to different parts of the mine. It will be noticed that the walls are of brick and the roof of steel I-beams. This type of construction is used at all important junction points in the mine where the roof will not support itself.

In Fig. 3 a new "stunt" in the use of brick piers is shown. These piers are 8 x 30 in. and are set up on as straight a line as possible. Across the top of these piers a 60-lb. steel rail is laid, giving a bearing for the I-beams that would not ordinarily come on top of the piers. To the left of the illustration the old wood timbers can be seen standing, but these will shortly be replaced by brick piers.

The trolley wires are supported from the I-beams. Two pieces of steel are bolted to the beam, these projecting downward, a block of wood being fastened between them. To this block of wood the hanger for the trolley wire is fastened.

Coal Production for First Half of 1918

Bituminous coal production during the first half of 1918 was 311,216,000 tons. This is an increase of 12 per cent. over the previous high record made during the same period of 1917. Anthracite production from Apr. 1 to Sept. 28 was 51,651,000 tons. This shows an increase of 2.1 per cent. over last year's record. The figures are those of C. E. Lesher, the geologist in charge of coal statistics for the United States Geological Survey. They were made public by the Fuel Adminstration with the following comment:

These production records were established in the face of many handicaps, chief of which was a reduced man power at the mines. It is estimated that the draft took between 50,000 and 60,000 coal miners during the last year, while probably as many men left the mines to work in other war industries.

By working more regularly than ever before the men who remained at the mines have been able to offset this loss in man power. Responding to appeals to their patriotism, which have been made directly to them by representatives of the Fuel Administration, the miners generally have been working full days and full weeks and foregoing many of the holidays and vacations which they were accustomed to take in the past.

Car shortage has limited production during the last six months. The weekly reports show that from 4 to 18 per cent. of full time has been lost by lack of cars for loading. In most districts, however, there has been a material improvement in this respect during the last few months. The loss of time during the last week of September was 6 per cent.

A factor that may tend to curtail production during the current month is the appearance of Spanish influenza in many of the mining districts of the east. Every effort is being made by the mine authorities to prevent the spread of the epidemic, but temporarily, at least, the precautionary measures that have had to be taken, as well as the disease itself, will have an adverse effect on the production returns from certain districts.

Although the bituminous tonnage of the last six months broke all previous records, it was still 10,897,000, or 3.4 per cent. short of the requirements for that period. Because of the great increase in the demand for coal for the nation's war industries and other military purposes, the requirements for the last six months exceeded those of the same period in 1917 by 44,315,000 net tons, or approximately 16 per cent.

The deficit in bituminous production must be made up in the second half of the production year by a still further increase in production, by conservation, which will reduce actual consumption below the estimated requirements, or by a combination of both.

Terms Used in Timbering

Certain terms are used in connection with timbering work in Illinois mines. Thus a "collar bar" is a timber used to hold up top and is placed parallel to the entry and across the room neck; this is the only place in the mine where such a timber is found. A "cross bar" is a term used to denote a timber which is placed at right angles to an entry. It may be found at any point on an entry.

Purchase of Mining Machinery and Supplies

By C. E. BOWRON
Birmingham, Ala.

SYNOPSIS—*Mining machinery is of two general classes—that built for long service and that built to operate for a short time only. Several considerations must be taken into careful account when buying equipment. Per pound prices by themselves are hardly comparable unless the machines in size, weight, capacity and design are nearly identical or at least closely similar.*

THE judicious purchase of mining machinery and supplies demands careful consideration of many factors. All mining men are familiar with machinery and apparatus at various plants which is "too good to throw away," but "not good enough to keep." Too much machinery has been bought and is still being purchased on a price rather than on a cost basis. Thus the cost of a piece of machinery does not end with the payment of the original invoice, and to get at its true lifetime cost we must add the expense of keeping it in an efficient state of repair and also the cost of operating it.

A first consideration that must be given attention is the duty required from a machine, its probable cycle of operation and its probable life. We can afford to pay more for a piece of machinery intended to yield many years of service than for one expected to give only a few months' service; more for a piece which must operate 24 hours a day than for one to operate 1 hour daily; or when, by paying more, we insure against breakdowns and gain in economy of operation.

Expensive Versus Cheap Machinery

In a great many lines of machinery at least two grades exist. It will be found upon careful investigation that there are usually good reasons for the more expensive grades, perhaps not always apparent to casual inspection. Among these are heavier or more economical design, higher grade metals, more expensive finish, higher grade workmanship, interchangeable parts built to templet, extra attachments, etc. In some lines the cheaper designs are termed "competitive" and are those offered when the simplest, plainest and cheapest thing that will do the work for a while is wanted. One is rarely surprised at their breakdown and early failure. For example, in looking over some old proposal sheets I find two boiler feed pumps offered for the same duty, one a 10 x 7 x 12 duplex piston pump, plain fitted, weighing 1740 lb., price $290, and the other an 8 x 5 x 12 duplex, outside-packed plunger pump, bronze fitted, weighing 3500 lb., price $1050.

After a survey of the requirements, it is therefore the part of wisdom, in asking for proposals, to advise some of the leading specifications or to state fully the required duty to be performed, with some statement as to the grade or economy of the machine desired. Proposals may thus be all made on the same grade of machinery and therefore be truly competitive. Furthermore, they may then be compared relative to the fine points of difference. It is wise to purchase machinery a little too large rather than just up to the capacity desired, or a little too small, as mining plants often have a disconcerting way of "growing too big for their breeches."

The specifications sent out and the proposals received, for machinery of any size or importance, should be the subject of conference between responsible officials such as the master mechanic, engineer, superintendent or others. There are entirely too many men entrusted with the specification and purchase of machinery whose experience is limited, who are not familiar with the values involved, or who are hidebound or perhaps prejudiced in favor of a certain make because they are familiar with it only. Experience in buying will, in the course of time, enable one to confine inquiries to those firms whose goods have been found satisfactory and yet secure sufficiently diversified bids from which to choose.

New Machinery Should Be Investigated

Machinery of new design, even when brought out by reputable concerns, must be bought with caution and with strong guarantees. Some years ago I purchased an air compressor of new design (now a familiar one) from one of the leading manufacturers. It so happened that this firm had built numbers of this type of machine in smaller sizes, but the machine bought was the first one of its size. While on the whole its performance was satisfactory, the makers made perhaps two dozen changes in small details when my employers purchased a second machine a year later, most of the changes resulting from our experience with the first machine.

Proposals should include full specifications on machinery or apparatus offered, advising sizes and dimensions of leading parts, description of metals to be used, weights, power required to operate (in the case of power-consuming machinery) and other essential data, accompanied by blueprints and photographs where necessary to give a clear idea of appearance or construction. It is sometimes like pulling teeth to secure essential data for comparison, from some firms who perhaps fear to disclose the secrets (?) of their designs.

Having in hand a number of proposals, these should be listed on large ruled sheets, showing names of bidders, with the various data in columns, so that the eye can follow each item all the way through the various bids. Prices should be reduced to the same basis—that is, all either f.o.b. factory or delivered at destination. Proposals should be carefully examined to see that all proper or desired items are included. Thus with engines, one maker may include a continuous oiling system worth possibly several hundred dollars, while another may include plain oil cups; one may include throttle valve, foundation bolts and washers, and another may not. Do not take it for granted that anything will be furnished unless it is included in the spec-

ifications or shown on the plan, forming a part of the specifications or proposal.

The price per pound may be worked out and compared. These per pound prices must be viewed with caution, however, and not be taken by themselves. With machinery of absolutely the same class and design, and approximately the same weight, they are a fair general criterion and in any case are a rough guide. It is a possibility, however, that the builder of a steam engine or air compressor, for example, may put an excessive and unnecessary amount of metal in a bedplate or other casting, which might make his product cheap per pound. If this extra weight were evenly distributed throughout the machine, this might be highly advantageous. It is necessary, therefore, in connection with a consideration of relative weights, to examine carefully the relative sizes of similar parts such as shafts, flywheels, rods, pins, bearings, the thicknesses of cylinder walls, etc., to see if the extra weight is justified. There are cases where builders still adhere to original patterns, too heavy in some details but satisfactory in service, rather than go to the expense of a new set of patterns; others, were they to redesign their machines, would make them somewhat heavier. Thus the criterion of weight alone will not by itself answer, but must nevertheless be carefully considered.

Relative Speeds of Machinery Important

In the case of machinery such as pumps, motors, engines, compressors, etc., the relative speeds of the machines offered should be taken into consideration. Slow-speed electrical machinery, especially, is necessarily more costly to build than that designed for high speed, since it involves the use of more copper. Slow-speed machinery in general would be expected to last longer and require less repairs than high-speed, as witness some of the old corliss engines still doing duty with very fair efficiency. In the case of air compressors, it would seem fair to compare their capacities and unit values at the same piston speed rather than on their nominal displacements at varying speeds.

The economy factor, in the case of power-consuming apparatus, should receive careful attention. Thus in the case of a large mine pump operating 12 to 24 hours per day, we could afford to pay a good deal more for a machine with an efficiency of 80 per cent. than for one with 60 per cent. efficiency. Let us assume a concrete example, say an electrically driven mine pump to handle 450 gal. per minute against a head of 500 ft., including pipe friction. There is thus $450 \times 8\frac{1}{3} \times 500 \div 33{,}000 = 56.8$ hp. in the water.

We are offered a triplex pump with an efficiency of 80 per cent., costing with motor $5500; and a centrifugal pump with an efficiency of 60 per cent., costing with motor $3500. Which shall we buy for a permanent installation, assuming that we can afford the more expensive machine? At 85 per cent. motor efficiency in both cases the horsepower inputs to the motors would be $56.8 \div 0.80 \div 0.85 =$ say 84 hp. in the case of the triplex and $56.8 \div 0.60 \div 0.85 =$ say 111 hp. in the case of the centrifugal. If power costs 1c. per kw.-hr. or $\frac{3}{4}$c. per hp.-hr., and the pump is to work 12 hours every day, the triplex would save in cost of power per year $(111 - 84) \times 12 \times 365 \times \frac{3}{4}$c. = say $887.

If from this we deduct 12 per cent. interest and depreciation on the $2000 difference in price between the two pumps, we would have $647 per year net saving, or, if we consider that the triplex would cost more for upkeep, say only $500 per year. If money is worth 6 per cent., we would be justified in spending $500 \div 0.06 =$ say $8000 for the triplex rather than accept the other pump for nothing, under the conditions assumed.

When a Cheaper Pump Is Advisable

If on the other hand the pump, to assume an extreme example, had to work only one hour per day instead of 12 hours, the saving in power would only amount to $\frac{1}{12}$ of the above figure, or $74, which would not equal the interest and depreciation on the extra investment required, and the purchase of the cheaper pump would be advisable. It might well be noted, although not germane to this article, that the common method of operating direct-acting steam pattern pumps underground with compressed air is one of the most wasteful power operations encountered at a coal mine.

In some lines of equipment it will be found that makers have closely agreed on base prices, leaving a decision as to purchase entirely to the relative merits of the goods. In other lines not only will prices be close together, but also general design and dimensions, and at times a decision gets down to a matter of personal preference based upon the general reputation of the maker or to personal familiarity with the several lines offered.

There will be found, for example, a marked similarity in design, dimensions and weights of several makes of large gyratory crushers as built by three or four manufacturers. There are sometimes proposals which are difficult to compare where designs, dimensions and all other details are widely different and where the question of suitability for the intended purpose is involved, making the purchase largely an engineering study: The various types of stokers and boilers furnish a good example of a case of this kind.

Should Exercise Care in Buying All Supplies

The same discrimination shown in the purchase of machinery, as has been roughly dwelt upon above, may well be exercised in the purchase of all kinds of apparatus and current supplies. To this end it is essential that proper records be kept showing the life and service obtained, together with first costs and unit costs. Under this head may be included such items as wire ropes, mine-car wheels and axles, belting, hose, packings, etc. Some simple form of card index will cover the needs of the average plant and the keeping of these records need not become burdensome. I recall one plant where records showed a saving in the monthly oil bill by the substitution of oil costing 50c. per gallon for oil costing 30c.

The same difference in grades, previously mentioned in machinery, will be found in many lines of supplies. Thus in rubber belting there exists a "standard" or competitive grade, with a better and perhaps a "best" grade and also a cheaper grade. In buying a pair of shoes or a suit of clothes you expect to get about the grade of stuff you pay for. In like manner the same applies when you are purchasing mining material; and you will not get something for nothing.

The larger mining companies with their well organized engineering, accounting and purchasing departments are of course buying along the general lines set forth above, but it seems that it is quite as important for the smaller company or operator to see that money is spent to the best advantage, with all factors thoroughly considered. It is hoped that such individuals and firms may find a useful idea or two in what has been written.

Where Government Runs the Coal Mines

Frank A. Henry, the United States Consul at Puerto Cabello, sends the following report on the coal mines in Venezuela:

"The only coal mines in the Puerto Cabello consular district that are being actively worked are located near Coro, in the State of Falcon. During 1917 these mines produced 4716 tons (of 2204.6 lb.) of the 20,164 tons produced for the whole country. The principal coal mines in Venezuela are situated near Guanta, and recent press reports indicate that production there has recently been increased to 70 tons per day. As imports of coal in 1916 amounted to 20,600 tons, of which 9100 tons were brought to this port, it is evident that local production will have to be very considerably increased before dependence on imported supplies will cease.

"The Coro mines are owned by the Venezuelan Government and operated through an administrator, who

also holds the same position for the Government-owned railway from Coro to its port, La Vela de Coro, about 9 miles distant. In his report for 1917 to the Minister of Fomento, the administrator called attention to the following conditions affecting the operation of mines. The methods of working are primitive in the extreme. Pick and shovel are the only implements used in mining. Lack of a suitable pump often results in the flooding of the mine and consequent suspension of work.

"Transportation conditions are equally primitive, and the necessity of hauling the coal several miles in small carts adds greatly to its cost. The extension of the La Vela-Coro R.R. a few miles to the mines would be the best solution of the transportation problem, but short of this the administrator has recommended the purchase of three motor trucks for this purpose. There are no storage places for the coal either in La Vela or Coro, nor is there any machinery for handling it at the water front. Only sailing lighters are used for loading vessels, and the charges, $0.77 per ton, add considerably to the cost of the fuel on board ship.

"The quality of the coal mined is said to be improving as the exploitation of the mine advances, and there is a good demand for all that can be produced. It is sold to the Government departments at $4.63 per ton and to private individuals at $7.72. During 1917, 4716 tons were extracted, the minimum production having been 126 tons in July and the maximum 645 in September.

During the year the cost of operations amounted to $25,760 and the receipts to $45,414. At the beginning of 1917 there was a stock of 4358 tons on hand, which was reduced to 60 tons at the end of the year. The sales during the last three years have been as follows: 1915, 2604 tons; 1916, 3637 tons; and 1917, 9014 tons.

"Due to the great demand for coal in Venezuela at present, owing to the cost and difficulties in importing from Great Britain and the United States, there is every reason to expect an increased output during the current year, although the same general methods of exploitation as formerly are likely to be followed."

Legal Department

DUTY TO INSPECT MACHINERY.—The duty of a coal operator to provide reasonably safe machinery and appliances in operations affecting his employees' safety does not end with the installation of safe machinery, etc. There is a continuing obligation to maintain a continuing oversight and inspection to avoid defects which may naturally be expected to arise from time to time. For example, the fact that brake shoes controlling the operation of cages in a mine shaft were safe when installed did not relieve the operator from liability for an accident occurring through a defective condition of the brakes afterward developed and permitted to remain so long as to raise an inference of negligence. (United States Circuit Court of Appeals, Eighth Circuit; Barrowman vs. Northern Central Coal Co.; 246 Federal Reporter, 906.)

PROVING NEGLIGENCE OF OPERATOR.—A coal operator, or other employer, is not to be charged with responsibility for injury to an employee on a theory of negligence in permitting some dangerous condition to exist, in the absence of proof that the employer knew or ought to have known of the defect in ample time to have remedied it before occurrence of the accident. On question being raised as to whether an operator was negligent in retaining an inexperienced jack setter to assist in the operation of a mining machine, resulting in injury to plaintiff, a member of the machine crew, it must be presumed, in the absence of proof to the contrary, that the jack setter properly inspected a mine roof before setting up a jack, although there was a fall of rock at that point when plaintiff, in the course of his duties, afterward removed the jack. (Missouri Supreme Court, Haggard vs. McGrew Coal Co., 200 Southwestern Reporter, 1072.)

TAXING MONTANA COAL DEPOSITS.—The provision in the Montana constitution that "the annual net proceeds of all mines and mining claims shall be taxed" applies to all mineral deposits and makes them taxable only when capable of yielding proceeds. But where an owner of lands conveys them, reserving underlying coal and the right to use the surface for the purpose of exploring and mining the coal, the fact that until development the coal would not be subject to taxation does not avoid taxation of the value of the surface rights reserved, they constituting a separately taxable interest in land. In such case, in determining the value of the reservation of right in the surface, the cash value of the land, less the underlying minerals, is to be ascertained as if the entire property were vested in one person, and an equitable apportionment made by the assessor between the grantee of the property, subject to the reservations, and the reserving grantor. (Montana Supreme Court, Northern Pacific Railway Co. vs. Musselshell County, 169 Pacific Reporter, 53.)

Increased Coal Storage Authorized

Increased storage of bituminous coal by consumers was authorized on Oct. 16 in regulations issued by the United States Fuel Administration. All classes of consumers, except Class 1, as defined by the War Industries Board, were authorized to increase their reserve stocks, and those heretofore not on the preference list were authorized to lay in additional reserve supplies. Consumers in Class 2 may store their coal up to the limits now imposed on Class 1. Consumers heretofore in Class 3 will receive the facilities heretofore accorded to Class 2, and consumers in Class 4 have been allotted the opportunities heretofore reserved for Class 3. Consumers not on the preference list are allowed the stocks formerly permitted Class 4 concerns.

The regulations, it was announced, will stand until further notice, and it was stated that, under them, an opportunity is afforded every industrial consumer for laying in at this time some reserve supply of bituminous coal. Regulations in detail are as follows:

CONSUMERS IN CLASSES 1 and 2.

Maine, 135 days.
Massachusetts, Vermont, New Hampshire, Northern New York, 105 days.
Connecticut, Rhode Island, Southwestern New York, 90 days.
Southeastern New York and New Jersey, 60 days.
Delaware, East Pennsylvania, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Florida and Western Ohio, 45 days.
Western Pennsylvania, West Virginia, Eastern Kentucky, Eastern Ohio, 35 days.
Lower Michigan, 90 days.

CONSUMERS IN CLASS 3

Maine, 120 days.
Massachusetts, Vermont, New Hampshire, Northern New York, 90 days.
Connecticut, Rhode Island, Southwestern New York, 75 days.
Southeastern New York and New Jersey, 50 days.
Delaware, Eastern Pennsylvania, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Florida, Western Ohio, 40 days.
Western Pennsylvania, West Virginia, Eastern Kentucky and Eastern Ohio, 30 days.
Lower Michigan, 75 days.

CONSUMERS IN CLASS 4

Maine, 105 days.
Massachusetts, Vermont, New Hampshire, Northern New York, 75 days.
Connecticut, Rhode Island, Southwestern New York, 60 days.
Southeastern New York and New Jersey, 40 days.
Delaware, Eastern Pennsylvania, Maryland, District of Columbia, North Carolina, South Carolina, Georgia, Virginia, Florida, Western Ohio, 35 days.
Western Pennsylvania, West Virginia, Eastern Kentucky and Eastern Ohio, 25 days.
Lower Michigan, 60 days.

Consumers not on the preference list are limited to the following stocks:

Maine, 90 days.
Massachusetts, Vermont, New Hampshire and Northern New York, 60 days.
Connecticut, Rhode Island, Southwestern New York, 45 days.
Southeastern New York and New Jersey, 30 days.
Delaware, Eastern Pennsylvania, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, Georgia, Florida and Western Ohio, 30 days.
Western Pennsylvania, West Virginia, Eastern Kentucky and Eastern Ohio, 20 days.
Lower Michigan, 45 days.

There is no restriction on the stocks of screenings which may be accumulated by either preference or non-preference consumers, nor is there any restriction on the stocks of Indiana, Illinois or western coal which consumers in any class may obtain. Supervision of the accumulation of stocks in accordance with these limits will be exercised by the several State Fuel Administrators, who are authorized to make exceptions where special conditions make it necessary.

To Investigate Alaskan Coal Fields

To confer with officials of the Alaskan Engineering Commission relative to the coal resources of the Anchorage district and to make a personal inspection of the Matanuska field is the mission of a special Federal commission appointed by Secretary of the Interior Franklin K. Lane. The members of the Federal commission are E. O. McCormick, vice-president of the Southern Pacific R. R., chairman; George Watkins Evans, of the Bureau of Mines, University of Washington, Seattle, Wash.; George C. McFadden, chief engineer of the Chicago Coal Co., and L. A. O. Gabaney, geologist, of Chicago. The commission is now at work in Alaska.

Special Fuel Commission Named

Appointment of a special commission of the United States Fuel Administration to inquire into conditions and government regulations affecting the coal industry in foreign countries was announced on Oct. 15 by Fuel Administrator Harry A. Garfield. The commission will consist of Walter E. Hope, who joined the Fuel Administration on Sept. 19, 1917, as Director of the Bureau

of State Organizations; S. Brinckerhoff Thorne, of New York, coal expert, and James H. Allport, one of the engineers to the Fuel Administration. They will sail soon for Europe.

Mr. Hope went to the Fuel Administration from New York where he is a member of the law firm of Maston & Nichols. He is a graduate of the New York Law School, and of Princeton, where he was editor of the *Daily Princetonian.*

Mr. Thorne is a graduate of Yale, '96, and is president of the Temple Coal Co. and of Thorne, Neal & Co., coal distributors. At college he played three years on the 'varsity football and was captain of the team the last year. Since then his business has been coal.

Mr. Allport is a consulting engineer of national reputation. Prior to his connection with the Fuel Administration he was connected with many companies. He attended the University of Pennsylvania, taking special courses, and lives at Phillipsburg, Center County, Pennsylvania.

Railroads Moving More Coal This Year

An increase of 11.7 per cent. in the bituminous coal loading in the eastern region took place between Jan. 1 and Sept. 30 as compared with the corresponding period of 1917. This is based on a report to the Railroad Administration by A. H. Smith, the regional director. The percentage of increase or decrease on the various roads is as follows:

	Cars	Per Cent.		Cars	Per Cent.
B. & O.	115,985	31.0	N. Y. C.	188,287	2.8*
B. R. & P.	183,271	9.0	Penn. West.	463,706	21.0
Cent. Ind.	2,757	70.0	P. M.	8,633	5.0
C. I. & L.	31,433	28.0	P. & S.	43,567	3.0*
C. I. & W.	5,094	67.0	T. & O. C.	87,271	18.0
C. C. C. & St. L.	155,231	4.0	T. St. L. & W.	13,341	
D. T. & L.	8,559	1.6	Wabash	52,298	12.0*
Erie	24,537	1.0	P. C. & Y.	11,938	5.0
H. V.	107,642	11.0	W. & L. E.	70,492	29.0
K. & M.	58,479	2.7			

* Decrease.

Increase in the number of cars loaded in 1918, up to and including the week ending Oct. 5, over the corresponding period of 1917, is 682,112 cars. Coal loaded by all roads during the week ended Sept. 28, and compared with corresponding week of 1917, is as follows:

	1918	1917
Total cars bituminous	226,345	190,467
Total cars anthracite	40,524	42,008
Total cars lignite	4,040	3,679
Grand total cars all coal	270,909	236,154

A summary of reports for week ended Oct. 5, 1918, based on actual reports from most roads, but with the results of some roads estimated, follows:

	1918	1917
Total cars bituminous	209,432	186,699
Total cars anthracite	38,550	42,079
Total cars lignite	3,452	3,122
Grand total cars all coal	251,434	231,900

One of the most promising features of the car situation, as it applies to movement this winter, is the fact that 31,794,000 cars of grain had been moved up to Oct. 1, as compared with 4171 cars for the same period of last year.

A review of the coal budget is to be made by the Fuel Administration, in light of the six-months' figures. Some realignment of tonnage will take place.

Anthracite Shipments for September, 1918

The shipments of anthracite for September, as furnished to the Anthracite Bureau of Information, amounted to 6,234,395 tons as compared with 6,372,756 tons for September last year and 7,180,923 tons for the month of August this year, showing a decrease over September of last year of 138,361 tons, and a decrease as compared with August this year of 946,528 tons. The small production in September as compared with August is due principally to the fewer number of working days last month; five Sundays and one legal holiday (Labor Day) reducing the number of working days in September to twenty-four, whereas there were twenty-seven working days in August.

The average daily shipments in September of this year were 259,766 tons against 254,910 tons for the corresponding month of last year, a record which, considering labor conditions at the present time, indicates that the anthracite industry is not laggard in its duty to the Government and the public. The shipments by companies were as follows:

	September, 1918	September, 1917	Coal Year, 1918	Coal Year, 1917
P. & R. Ry.	1,231,435	1,246,100	7,996,029	7,562,874
L. V. R.R.	1,167,784	1,258,922	7,694,157	7,370,946
C. R.R. of N. J.	571,147	559,581	3,574,745	3,536,845
D. L. & W. R.R.	927,608	973,529	6,071,574	6,214,638
D. & H. Co.	736,497	698,731	4,775,049	4,471,142
Penna. R.R.	433,068	422,482	2,866,556	2,869,645
Erie R.R.	703,363	717,129	4,587,653	4,556,139
N. Y. O. & W. Ry.	157,387	155,886	1,045,026	1,018,010
L. & N. E. R.R.	306,106	340,396	2,012,602	2,069,626
Total	6,234,395	6,372,756	40,623,391	39,669,865

Influenza Affects Coal Output

Coal production will be cut down 5 to 50 per cent. in the various producing districts by the influenza epidemic, according to reports reaching the Fuel Administration. It is believed, however, that the higher figure mentioned hardly is a conservative estimate. Nevertheless, the Fuel Administration is taking no chances. James B. Neale, the director of production, has been authorized to open temporary hospitals wherever it is practicable.

Brief Washington Notes

Suspension of automobile, motor-cycle and motor-boat racing for the period of the war has been requested by the Fuel Administrator.

To assure the Senate that he approves of liberal account being taken of depletion and the extra hazard in coal mining, Dr. Garfield appeared before the Finance committee Oct. 15. The session was executive.

A new set of coal zone orders, which will consolidate all the summer's modifications and changes is soon to be issued by the Fuel Administration. Owing to the multiplicity of separate modification orders difficulty often is experienced in keeping up with them all.

Collection of reports of mining engineers in the course of its war work made clear to the Bureau of Mines the great value of having such technical and economic information on file at all times. As a result the Bureau has begun a systematic effort to collect all such reports available. A file also will be maintained of the quarterly, annual and other reports of mining companies.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

The anthracite wage problem has not yet reached complete solution though that may come at any time. The proposed wage schedule will be found with appropriate comment on page 789 of this issue. Meantime the production of coal is proceeding smoothly in the anthracite region. No labor troubles are now occurring and the only interference with output arises from the influenza. Minersville, in the Southern field, is so grieviously afflicted that it has been necessary to call on the Army Ambulance Corps at Allentown, 51 of the army surgeons from that city having been obliged to locate in and about that section.

Central Pennsylvania production has been checked by two adverse influences—the victories in France and the Spanish, or should it be the German, influenza. As for the victories, they have been enthusiastically followed by the mine workers of the Keystone State and the miners were so much impressed by the importance of the Allied advances that they were quite prepared to hear that the Kaiser had surrendered, so prepared, indeed, that when the rumor circulated that the long-hoped-for event had occurred they not only ceased buying Liberty Bonds, but left the mines to celebrate. Unfortunately the story was not true and was made only the less likely by the untimely celebration. By the premature closing of the mines the time when the Kaiser will be "smothered with coal" becomes only more remote.

The cause of the trouble is declared to be German propaganda, but unfortunately it is not necessary to imagine any such source. The story was already in the minds of everybody, ready to be given spread and credence. There is altogether too much of a disposition to believe that the battle is over. A little reading of British and American casualty lists and the account of U-boat activity will act as a corrective for such excessive optimism. The Germans are not yet beaten. It is still not impossible that the British will so far outrun their artillery that the Germans will be able to turn on them as the French turned on the Germans at the Marne.

Courtesy "American Coal Miner"

THEY ARE NOT HOISTING BOOZE—BUT COAL

The Germans by their apparent yielding did the Liberty Loan sale no little injury and shut down several mines. In Winber alone the loss in production of the Berwind-White Coal Mining Co. was 6000 tons. Along the Southfork branch near Johnstown, Penn., there was a loss of 4000 tons. The Portage branch in the same vicinity produced 2000 tons less fuel. At Ehrenfeld, Nanty-Glo, Beaverdale and other operations of the Pennsylvania Coal and Coke Co. the idle mines failed to produce their regular quota of 3000 tons per day. These are only a few of many mines affected. The action of the miners was widespread, and operators would do well to warn everybody in authority against spreading rumors about Allied success unless it is duly verified from Washington.

A number of excellent suggestions regarding the combating of Spanish "flu" have been spread broadcast by the Central Pennsylvania Coal Producers' Association. It might be well to add a few others: Avoid facing any person too closely when talking. Some people have an unpleasant way of crowding their faces into the faces of their friends when trying to enforce an argument. It is a rude and dangerous habit at any time and it is worse now than ever.

SHOULD AVOID COMMON TOWEL AND WASHBOWL

Avoid the use of the common towel. Your own manners may be cleanly, but you cannot tell how others have acted in using that public utensil. Avoid the common washbowl unless it has been sterilized or properly scalded. Some men make a practice of cleaning their nasal passages when washing, and merely pouring out the water does not cure the evil. The scum found on the sides of every washbasin shows that such cleansing is inefficient.

Where pillows are removed from beds for sunning and ventilation—and the practice is surely to be recommended—their exchange should be avoided. Every effort should be made to let every person have his own pillow, his own towel and his own washrag. Someday we shall not only have them, each for himself, but we shall have them properly marked so that identification will be unquestioned.

We should be wary of everyone. The "cured" may carry the germs. The fact that they are well may only show that they have built up a defense. They are not harmed any longer by the germs, but that is because they have the power to counteract any evil influence they might have on the person harboring them. It does not show that the germs are destroyed or incapable of infecting other persons. "Typhoid Mary," in perfect health, harbored typhoid germs for years and infected all who came in contact with her. She was finally interned.

PENNSYLVANIA SUFFERS FROM GRIP AND ALIENS

In seven places in central Pennsylvania the mines have been closed by influenza while as many more have had their production cut as much as 50 per cent. The mines closed were those at Wishaw, Eleanora, Florence, Soldier, McIntyre, Coal Run and Conifer. Ernest, Finleyville, Clymer, Dixonville, Rossiter and the Broad Top regions were operated with greatly reduced forces.

The people of central Pennsylvania and especially the miners are determined to exclude from the mines the unpatriotic enemy aliens who will not mine coal and are trying to make trouble. The Pennsylvania State Constabulary at Punxsutawney will help in the roundup. Samuel Lakatosh, an Austrian enemy alien, employed at the Potts Run Land Co.'s mine, at Boardman, was placed under arrest by Constable Thomas B. Reilly, of Clearfield, after a running revolver fight. This man mined only 16 tons for the month ending Sept. 21—about three ordinary days' work. He spent his time, not in mining coal, but in visiting his fellow aliens, declaring to them that they "had no business

getting out coal to kill their brothers in Austria." Personal notice is being served on some 300 or 400 Austrians that they must report regularly for duty and get out a full day's output or they will be interned.

The wage increases of the New River and Winding Gulf regions, granted at the close of last year, were based on the irregularity of the miner's opportunity to work. The mine workers readily saw that the increases should go only to those suffering by that irregularity. They were quite content that the "monthly men," who were paid as much whether the mines worked or were idle, should receive the same wage as before. But times have changed. The railroads are supplying all the coal cars needed, and the day worker now gets as steady work as he desires and quite a little more than some of the less diligent would wish to receive.

The monthly man, who was fortunately situated before, now feels he is discriminated against. The increase which was granted for the short time suffered by the day man, in his belief, is the right of the monthly man also. Thus wages climb steadily upward on the inequalities of our industrial situation. The mine workers of District No. 29, which embraces the New River and Winding Gulf districts, at a special convention held Oct. 8 at Beckley, passed a resolution notifying the operators that they would strike if the full wage increase of $1.40 a day were not granted to monthly men.

Monthly Men Want Increase of Day Men

So far there has been no strike and a vote on the question of striking is said to have resulted unfavorably to any such action. However, just consideration should be given to the increased cost of living, and the monthly men might well be granted an increase if it can be shown that they are entitled for this reason to an increased emolument. The shortage of miners has in most cases increased the "turn" in the mines so that not only more days' work are secured but more tonnage is put out per day worked. The contract miner is in clover and the monthly man should not be dieted on thistles.

The miners contend that under what is known as the "Washington agreement," as it was adopted at a conference November, 1917, the words "monthly men" were not inserted in the form in which they appeared in the original Washington agreement. The mine workers contend that the operators have taken advantage of this variation in phraseology and have refused to pay the advance of $1.40 a day to monthly men.

West Virginia is fast becoming unionized. It was formerly the stronghold of the nonunion operator. Now there are few parts without union locals. The change in the Fairmont (W. Va.) region has extended now to those mines in Kentucky owned by the Fairmont interests—the Consolidation Coal Co. Vice-president Petry of District 17 has just returned to Charleston from the Big Sandy section of Kentucky, where he spent several days recently. He organized on his trip the mines at Auxier.

Patriotic Miner Earns $716 in a Month

The largest wage paid in Monongalia County to any coal miner was probably that paid during the month of September to Lawrence Finzel by the Hartman Run Coal Co., whose mines are near Sabraton. The payroll of the company shows that he received $716.40 for the month of September. He loaded 417 cars or 730 tons during the month. In the first half of the month he loaded 201 cars and earned $281.40. In addition he earned $57 for labor performed Thus he received a total of $338.40 for the first two weeks in September.

In the last half he loaded 216 cars, earning $378, thus making the grand total — "grand total" is right — of $716.40. If he keeps up the rate Finzel will make $8596.80 a year, an annual income which few industrial managers can duplicate.

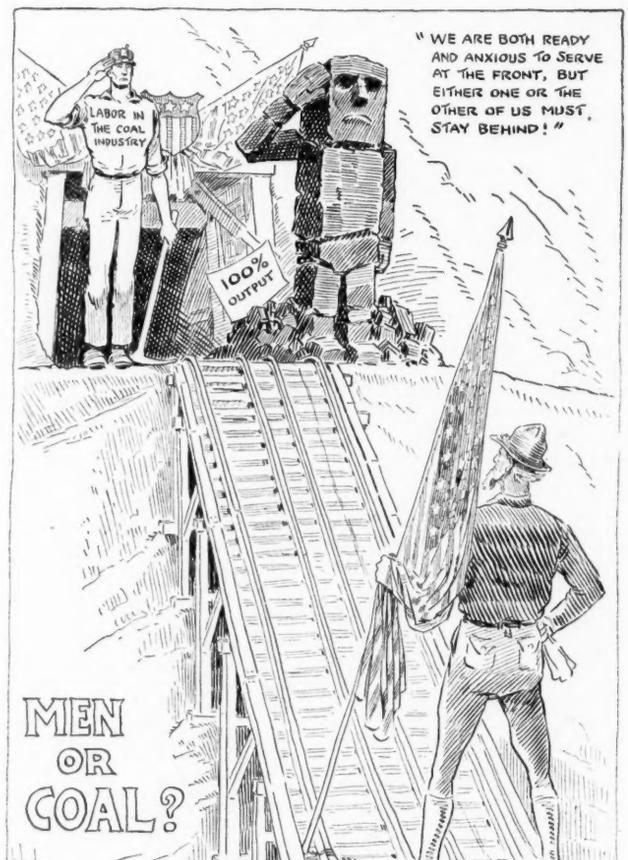
The miners of the United States Coal and Coke Co., on Tug River, are not content with the regular day's run. For three successive Saturdays these men have gone back to work after supper, and the result of their patriotic work has been the shipping to market of 20,900 tons more than would have been shipped had this sacrifice not been made. When one thinks how men look forward to Saturday, their sacrifice appears almost heroic. If you would visualize the result of the patriotism perhaps it can best be done by remembering that the output made by this overtime work would fill 418 railway cars of 50 tons capacity.

Reports of large earnings also come from the West. John Crawford, the state inspector of coal mines in Utah, states that the average wage in the mines of Carbon County will run between $10 and $15 a day. At present the men are working six days a week. A few exceptional men at the Black Hawk and Standard mine in July and August made each month as much as $455, $460, $530 and $533 for machine work. Under normal conditions it was exceptional for a man in Carbon County to make $100 a month. Now quite generally men are receiving $250 a month and even more. The shifts are only of 8-hour duration. The data at present available show that there is no probability of any shortage of coal in the region served by the Carbon County fields.

Must Have Good Houses for Mine Men

The drive to secure men at the mines, in which the union is participating, has moved Walter Nesbit, secretary and treasurer of District 12 of the United Mine Workers, (Illinois, in other words) to protest against overlooking the housing provisions whenever men are being sought. He does not believe that there is much need for a campaign when housing facilities are good, and the dwellings are as attractive as they are around Springfield. He suggests that the United States Employment Service should inquire into this matter when preparing to secure men for a plant.

"You cannot expect men to bring their families to live where there are no adequate housing accommodations," he said. "Even when they have no families, men who work


" WE ARE BOTH READY AND ANXIOUS TO SERVE AT THE FRONT, BUT EITHER ONE OR THE OTHER OF US MUST STAY BEHIND! "
LABOR IN THE COAL INDUSTRY
100% OUTPUT
MEN OR COAL?

Courtesy of "The Retail Coalman"

LABOR MUST STAY, FOR COAL IS VITALLY NECESSARY

as hard as miners need to be decently housed. Men will not go to work where they have to live in tents and mine bunks if they have the opportunity to live where they can get better housing conditions."

Nesbit said an application has been made to him by an operator whose mine was at a distance, asking for a large number of miners, but when he found that the men would have to live in tents he would have nothing to do with it. But Nesbit and the other union officials will coöperate fully with the Government in its efforts to get former miners back into the mines. The efforts in the drive are to be concentrated mainly on that class. The many men who have left the mines in recent years will be reached through the unions and will be urged to return to the mines and remain there until the war has been won.

Anthracite Wage Increase Proposed

On his return from Washington, Oct. 12, James Matthews, president of District No. 9 of the United Mine Workers of America and hence a member of the Anthracite Conciliation Board and a member of the board which was formed to suggest the terms of a new wage scale, revealed the nature of the contract which had met with the approval of the latter board. This contract is to be submitted to a committee composed of the various War Labor Boards and then to Dr. H. A. Garfield, the United States Fuel Administrator. It seems quite sure of approval by both of them, and the scale will doubtless become operative if the mine workers do not oppose it as containing less than they desired in the matter of wages and pay for overtime.

The recommendations mentioned are as follows and are placed in juxta-position to the terms of the contract of Nov. 17, 1917, so that they may be readily compared:

Proposed New Anthracite Wage Agreement

a. Contract hand and machine miners shall be paid an advance of 40 per cent. on their gross earnings. b. Consideration miners shall be paid an advance of 25 per cent. plus $1 a day for each day worked. c. Contract miners' laborers shall be paid an advance of 40 per cent. on their earnings. As this increase of 10 per cent. over the agreement of Nov. 17, 1917, is less than $1 per basic shift, the difference between said increase of 10 per cent. in the rate and $1 per basic shift shall be assumed by the operator. d. Consideration miners' laborers shall be paid an advance of 25 per cent. plus $1 a day for each day worked. e. Day machine miners' laborers who received not less than $2.72 per day shall be paid an advance of 25 per cent. plus $1 per day for each day worked.

f. Outside blacksmiths, carpenters, electricians, machinists, foremen, hoisting engineers on shafts and slopes where employment is limited by law or by the award of the Anthracite Coal Strike Commission to 8 hours a day and engineers working on a 12-hour shift basis shall be paid an advance of $2 a day for each day worked. All other outside company men who received $1.54 or more per day, shall be paid an advance of $1.80 a day each day worked. g. Inside engineers and pumpers working on a 12-hour shift basis shall be paid an advance of $2.20 per day for each day worked. All other inside company men who received $1.54 or more per day shall be paid an advance of $2 per day for each day worked. h. All employees paid by the day who received less than $1.54 per day shall be paid an advance of $1.20 a day for each day worked.

i. Monthly men coming under the agreement of May 5, 1916, shall receive an advance per day for each day worked equivalent to that provided for their respective occupations under paragraphs f and g.

j. The advance of $2.20 a day, $2 a day, $1.80 a day, $1.20 a day and 25 per cent. plus $1 a day, provided above, are to be applied to a day whether 8 hours or more, as established under the agreement of May 5, 1916. Any proportionate part of a day to be paid a proportionate part of the advances herein provided.

k. The employees of stripping contractors paid by the day, working on the basis of a 9-hour shift, shall be paid the same increase per hour worked that is provided for outside company men working on an 8-hour basis.

The new scale provides an increase to contract hand and machine miners of 12 per cent. over the contract of Nov. 17, 1917. Consideration miners get an increase of $1 per day. Contract miners' laborers get an increase of 7.692 per cent. but as this is less than $1 per day, an increase of $1 is assured them. Consideration miners' laborers get an increase of $1 per day and so do such machine miners' laborers as received not less than $2.75 a day under the contract of May 5, 1916.

Outside engineers working a 12-hour day put a dollar more daily into their pockets. Outside blacksmiths, carpenters, electricians, machinists, firemen, hoisting engineers on shafts and slopes, where employment is limited by law or by the award of the Anthracite Coal Strike Commission to 8 hours a day, receive an increase of $1.10 a day. All other outside company men who got, under the contract of May 5, 1916, $1.54 or more per day ($2.54 under the contract of Nov. 17, 1917) now receive 90c. a day more than under the contract of Nov. 17, 1917.

Inside engineers and pumpmen working on a 12-hour shift get $1.10 more per day than under the agreement of Nov. 17, 1917, and all other inside company men who under the contract of May 5, 1916 received $1.54 or more per day ($2.54 under the contract of Nov. 17, 1917) now get $1 more per day than under the contract of Nov. 17, 1917. All day men who under the contract of May 5, 1916, received less than $1.54 a day ($2.14 under the contract of Nov. 17, 1917) get an increase over and above the contract rate obtained under the contract of Nov. 17, 1917 of 60c. per day.

The revisers of the old contract seemed to have approached the matter in a commendable spirit. The anthracite miners had a degree of justification in their demand for a better wage, if for one moment the fact be overlooked that they were bound by a contract that could not be broken without a breach of faith. It must be conceded that the scale was much lower than in the bituminous region and in many cases so much lower that it was impossible to explain the fact away satisfactorily by calling attention to the great inequality in the regularity of operation normal to the two mining regions. The old contract is as follows:

Anthracite Wage Contract of Nov. 17, 1917

a. Contract hand and machine miners shall be paid an advance of 25 per cent. on their gross earnings. b. Consideration miners shall be paid an advance of 25 per cent. on their earnings. c. Contract miners' laborers shall be paid an advance of 30 per cent. on their earnings. d. Consideration miners' laborers shall be paid an advance of 25 per cent. on their earnings. e. Day machine miners' laborers, who received not less than $2.72 a day, shall be paid an advance of 25 per cent. on their earnings.

f. Outside engineers working a 12-hour day, cross-shift and firemen shall be paid an advance of $1 a day for each day worked. All other outside company men, who received $1.54 or more a day, shall be paid an advance of 90c. a day for each day worked. g. Inside engineers and pumpmen, working a 12-hour cross-shift, shall be paid an advance of $1.10 a day for each day worked. All other inside company men, who received $1.54 or more a day, shall be paid an advance of $1 a day for each day worked. h. All employees paid by the day, who received less than $1.54 a day, shall be paid an advance of 60c. a day for each day worked.

i. Monthly men coming under the agreement of May 5, 1916, shall receive an advance per day for each day worked, equivalent to that provided for their respective occupations under f and g.

j. Advances of $1.10 a day, $1 per day, 90c. per day and 60c. per day, provided above, are to be applied to a day, whether eight hours or more, as established under the agreement of May 5, 1916; any proportionate part of a day to be paid a proportionate part of the advances herein provided.

k. The employees of stripping contractors, paid by the day, working on the basis of a 9-hour or 10-hour shift, shall be paid the same increase per hour for each hour worked that is provided for outside company men working on an 8-hour basis.

EDITORIALS

Importance of Spreading Safety Work

AS A result of the well-attended and well-managed Congress of the National Safety Council in St. Louis, safety in that city made remarkable progress. It will be remembered that the meeting lasted from Sept. 16 to Sept. 21. It was a remarkable week, with an unbroken record of security from fatal accidents, except when an intoxicated man fell from his wagon into an excavation. That was the only death from accident in St. Louis, East St. Louis, Madison, Granite City and Venice in the week lasting from 8:30 p.m. Sept. 14 till 12:15 a.m. Sept. 22—a remarkable record in view of the great business activity which the pressure of the war has engendered.

Just a year before, in those same cities, 24 lives had been lost from accident within a single week. In the week before the Congress met ten lives had been the toll from that cause. In the whole year 1917, 510 lives, an average of nearly ten a week, had been taken by accident. Yet in the entire week of the Congress but one life was lost.

The week was dubbed "Safety Week" by proclamation of the mayors of the five cities. The newspapers, within the limits permitted by the United States Government, which is trying to save print paper as well as lives, gave the safety movement admirable support. They could not print extras, or they would have done so; for they had made preparations to give the movement that kind of publicity.

It was heralded far and wide that the week of the Congress was to be a "No Accident" week. At all the schools, public and parochial, talks were given on safety. Every child took home a letter relating to accident prevention and a bulletin proclaiming the same good story. The churches preached safety; the Roman Catholic Archbishop of St. Louis advocated it in a pastoral. The police force had daily drills to emphasize safety and were for the first time assembled for a talk about the importance of that part of their duties. It is quite likely that these 1600 men, who were enthusiastically behind the movement, had much to do with its success.

There were moving-picture exhibitions advocating safety in the many parks and recreation grounds of the city. It is said that 100,000 workmen and their families saw these pictures, and at the moving-picture houses at least 50,000 persons saw the safety films. The 40,000 owners of automobiles received a letter on the need for caution, and with these letters went safety stickers for the wind shields of their conveyances. A half million pay envelopes with safety mottoes were used during the week by employers in paying their men. The fire department also gave exhibitions which stimulated the general interest. At all the clubs which met during the week, and some met on purpose, addresses were given on safety. The large civic clubs—16 in all—were thus approached in the safety campaign.

St. Louis thus received safety, not in the unwelcome guise of an admonition from a self-righteous employer, but as part of a great national campaign. It came to the St. Louisan and to his wife and children as a movement of his own. And he embraced it. It went to his home. He heard it from his wife and from the lips of his child; he was confronted with it when he went to worship on Sunday and when he met with his friends at his favorite club during the week.

In the mining districts we cannot get "Safety First" if we treat the problem as a cold business proposition. It must not only be given the touch of nature which makes us all akin, but it must be made universal. The words "Universal Safety," which appear on the seal of the National Safety Council, express the idea well. We cannot get real safety so long as we keep our efforts narrowed to the straightened limits of the plant.

It must go all through the mining village; it must take in every one, male and female, young and old, and it must include every occupation in which any of the habitants are engaged. It must come at every angle and radiate from every center—office, surface plant, mine, church, school, club and press. Some are best approached in one direction, some in another. Let the employer be broad, and remember that the worst form of propaganda is the direct approach from employer to employee. Yet despite its imperfections, the more direct course is the one easier put in operation and therefore has the greater advantages. But while seeking safety of the employee by direct methods the indirect method of interesting everybody and creating a universal spirit of safety should never be overlooked.

Cold-Weather Instrument Work

DUE to the effect of varying temperatures on transits and levels during cold weather, many an hour is lost in winter surveying work. When the transitman enters a mine the instrument is often at a temperature well below zero. As a result, a heavy sweat which turns to hoar frost breaks out all over the instrument; or, to speak more correctly and so satisfy purists, the vapor in the air condenses on the cold surfaces of the instrument and promptly congeals.

This sweat beclouds the object glass and eyeglass, and sometimes even gets between the double lenses of which the object glass is composed. This causes no little delay. A long sight through the inevitable fog on the glass is difficult or impossible, and the transitman is prone to put his instrument to one side while he does other work or "joshes" the men on the job until such time as the transit has reached a temperature more nearly approximating the temperature of the mine workings.

Perhaps he tries to clean the lens. This is a job that seems endless, for the temperature of the lens being

only slowly bettered the mist settles on it as fast as the moisture is removed. If the instrument man has set up his instrument, traffic on the road is suspended, and the working forces of the mine are delayed to little or no purpose.

But the cleaning of the lens may have a worse effect. All rags and cloths taken into a mine are apt to be dirty, either from the slate and coal dust which fall from the roof and rib respectively into the surveyor's pocket, or from the dust flying in the air, or, in the case of a handkerchief, from the dirt and dust rubbed from the face and hands. If a silk rag, a chamois skin or a banknote be used, the damage to the lens may be, it is true, so small as to be immaterial. But a dirty linen or cotton cloth is almost sure to scratch the lens when used for its cleansing. A few such cleanings, and the clarity of the lens is markedly destroyed.

The moisture, moreover, settles all over the instrument and lights on the graduations. These also are easily scratched, if wiped by an uncleanly rag. Furthermore, if the water were just pure water, it would not be so bad. It seems likely that it is rarely pure in mines where explosives are being fired and the air is full of smoke. Because of this smoke it is usually acid water, and it tends therefore to corrode the instrument. An unprotected vertical arc soon becomes almost unreadable, and even the effect on the horizontal limb is quite noticeable.

But there are other sad possibilities. The water gets between the horizontal plates, and if it does not dry before the transitman comes out of the mine the plates will freeze together, or at any rate enough ice will form between them to make their relative movement difficult. If, then, the transitman wants to measure an angle when he reaches the surface, he finds it either impossible or difficult. At times the instrument would rather screw off at the head than turn in the manner designed. It then becames necessary to light a fire or go into some house and warm the instrument before a stove.

In the house the steaming kettle has probably filled the air with moisture, and again the transit is coated with a film of liquid; and even if it does thaw out, it is no sooner asked to officiate than it freezes again and the situation is unchanged. Back to the house goes the transitman with his little train of aides.

This is all very well if the instrument man likes a warm spot, if he is not anxious to get his work done and if his company is cheerfully willing to put up with the situation. But transitmen are not always so disposed. They are busy men, and often work late at night and till the early morning; and even when they do their best they are regarded as abnormally slow.

So a little thinking on this difficulty would surely be well worth while. An instrument should never be allowed to get unduly cold on its way to the mines even when a long trip has to be made. A quilted hood should be provided for it, and even then this should be warmed before a start is made. The hood should be tied tightly about the tripod head so as to exclude the cold air. This hood would also serve to protect the instrument against dust.

The instrument will undoubtedly get cooled on its way to the mines, and if by chance it is cold enough to sweat, the best plan is to seek a warm place as soon as the work is reached. A warm, smokeless heading on the way to work is usually available, or some old working where decaying timber raises the temperature above the normal. It is useless to hold up the regular mine work by a chilly instrument which will not operate. The instrument man can usually find some work to do while the instrument is reaching a normal temperature, especially if he has planned his work before leaving the office.

Instruments quite frequently get wet from rain and melting snow. Every opportunity should be taken during cold weather to dry them out. Otherwise the plates and the screws, both for leveling and adjusting, will become gummed and the result will be that time will be lost. There is often far too much haste to get away in the morning. An instrument, warm and properly protected, is a *sine quâ non* for a good day's work in the mine.

The tendency of an instrument to become covered with moisture on entering a warm room and so to be unruly when taken out to work, if in the meantime it does not get dried out, furnishes a reason for tightly covering an instrument with a quilted hood before entering the office. A stand in which the instrument can be placed without boxing is, therefore, to be strongly recommended.

It does not seem orderly to use such a stand, but it is certainly better than to box a damp instrument or one that is dried out only exteriorly. In any event the boxing of a transit is at best a severely jolting operation and somewhat hard on the adjustments. Thus it is apt to affect them as badly as running with an instrument over the shoulder.

"Seeing the Boss" Wastes Time and Temper

WE HAVE long ago become accustomed to seeing idle miners in our trips around the mines. It seems quite natural on passing a room to find a disconsolate digger waiting for cars, or for the air to clear, or hunting the driver in the hope that he may get rails or props on the next trip. Some miners, there still are, who do not go home when the trip runs slow, but wait patiently for an opportunity to work.

In many mines the miner can see the boss only in the morning or in the evening, at both of which times that dignitary is little disposed to listen because he is too busy. For this reason, the miner often comes out during the working day to see if he can, by some means, get an interview and secure an understanding. But more often he comes out at that time because only on reaching the face is he confronted with the actual conditions of his work. The place has perhaps become flooded from a neighboring room. His tool box has been broken open and his carbide stolen. A big fall of rock has made it impossible to put cars at his working face. So he comes out to see the boss.

Where this trip is a mile or a couple of miles each way, it is a great waste of time, even should the boss be found without difficulty. Now, every superintendent knows how hard it is to secure a liaison with a foreman even when he is willing to be found, but it is far harder for a miner to find a foreman when that foreman is anxious to avoid an interview. This seeing the boss is a great waste of time and temper under the conditions too often obtaining.

PASSING AROUND SPANISH INFLUENZA
Be As Wary of Your Own Family As You Are of Strangers
Using the Same Cup
Facing Each Other in the Cage
Scuffling
Drinking Weakens the Resistance
Using the Same Towel
Sneezing and Yawning

DISCUSSION BY READERS

Perplexities of Mine Foremen

Letter No. 2—With much interest I read the letter that appeared in *Coal Age*, Oct. 3, p. 656, dealing with a few of the perplexities of mine foremen. Surely, that official is sorely perplexed at times by little matters that it is beyond his power to control.

Taking advantage of the present situation in the coal field, many miners think that they are entitled to hold up the mine foreman for all that they can secure from him, and then some. Their patriotism does not prevent them from ceasing work for two or three days because of some trivial matter that calls for a little extra exertion or labor on their part. As a result, probably 30 or 40 tons of coal are lost to the daily output of the mine. They take this course, instead of working on, and allowing the matter to be adjusted in the proper manner.

The miner, today, is in a position to make more money than at any time in the history of the coal industry. It would seem, however, that the more some miners are paid for their work, the less willing they are to perform their share and keep things moving. The following incident that occurred recently at a mine in this district illustrates how a very small matter can interfere with the regular operation of a mine when a miner fails to put up with a little inconvenience on his part and do his share to keep the coal moving.

In the instance to which I refer, the machine runner had encountered a small roll when cutting the coal at the face of a room. Like the good cutter that he was, when starting to make another cut, he raised the cutterbar a few inches to avoid the roll. This left 4 or 5 in. of bottom coal that was not cut. When the miner entered his place the next morning, almost the first thing he saw was the thin layer of bottom coal that had not been cut. He at once started for the mine foreman and demanded that the cutter should return and cut out the coal so that he could lay his track, refusing to shoot down the coal if this was not done.

The foreman was at first surprised to see the condition of the place, but, on closer examination, discovered the roll and explained to the miner that the reason the cutter had not cut the bottom coal was to avoid running into the roll and breaking his machine. The foreman offered to pay the man for two hours' extra work for each cut if he would dig up the bottom coal enough to lay his track.

The miner seemed willing enough to do this for the pay offered by the foreman, but said that he would first have to see the committeeman who worked in the next place to him. Now, this particular committeeman had formerly run a machine, but had been taken off for indifferent work. The union, also, had elected him on the Production Committee for that mine, which gave him an idea of his own importance. He advised the loader not to touch the bottom, saying that he would see that it was taken up by the cutter. This, however, the foreman flatly refused to have done.

When the matter was referred to the Mine Committee, they decided that the loader was offered a fair price and should take up the bottom himself. Nevertheless, the committeeman previously mentioned induced the loader not to do this, and the matter was then brought to the notice of the Production Committee. At a meeting held in the mine office, the committee was informed that, owing to the difficulty, the mine was losing six cars a day. After hearing the case, the committee decided that the foreman was in the wrong, which was promptly denied by that official.

The superintendent, not wishing to delay longer in the matter, then took the loader aside, who, after a few minutes' talk, went back to his place. In one hour, the man had dug up the bottom and had his track laid ready to load his coal. For that work he was allowed four hours' pay.

Only recently, I attended a meeting of the Production Committee of the Indiana County mines, and listened to an address by Chas. O'Neill on production. In the course of his remarks, he stated that he wanted everybody to get a square deal. He insisted that the blame for non-production should be placed where it belonged, whether the fault was with the operator, the mine foreman, or the miner. He repeated that a mine foreman should get a square deal, when a voice in the audience rang out, "It can't be done." Few who are familiar with conditions existing in the mines today will deny the truth of this statement.

MINE FOREMAN.

Homer City, Penn.

Iron vs. Wood Mine Cars

Letter No. 1—Kindly permit me to give a little of my own experience in reply to the request for the opinions of readers in regard to the relative advantages of iron and wood mine cars. I have been connected with the mining of low coal for a number of years and can say, from actual experience, that the iron mine car is far superior to the wooden car, in every respect.

It must be admitted that the iron car is much more expensive in the beginning, but my belief is that it will always be found cheaper in the end. When an iron car is worn out, and is no longer of any use in the mine for hauling coal, it need not be thrown aside as having no value. The iron of the car body can often be used to advantage around a mine, or it can be sold as scrap iron for a fairly good price.

IRON CARS OPERATED IN LOW COAL

About eight years ago a company opened up a slope mine in a seam of low coal. They equipped this mine with 100 cars, among which were three made entirely of steel. The records show that during the eight years of continuous service not one of these three iron cars has ever been sent out of the mine for repairs and all of the three are still in use, doing good service. About

two years ago the same company placed an order for 100 more cars, and decided to make this order for iron cars only, the decision being based on the previous service of the three iron cars still in use.

Because of the way in which an iron car stands up under the severe service to which cars are subjected in the mines, less lost motion is developed and the haulage locomotive is able to handle a much larger number of cars than is the case when wooden cars are employed and these have been in use a short time. Moreover, iron cars are not derailed as often as wooden ones, because they are less liable to get out of line. The running gear of a wooden car that has been used but a short time is far less rigid than that of an iron car after the same service, and the car is more liable then to jump the tracks at a bad joint or on a sharp curve in the road. Again, it is necessary to inspect wooden cars more frequently and send them to the shop for repairs as quickly as any weakness develops, while an iron car will stand the same rough usage without showing any such weakness.

Iron Cars Possess the Important Advantage Of Being Dustproof

One advantage of iron cars over wooden cars is the fact that they are generally dustproof. If the oak used to make the wooden cars is not thoroughly seasoned it will shrink in use and the car will develop large cracks that permit the dust and fine coal to be scattered along the road. Another source of trouble, in the use of wooden cars, is the way in which the bumpers are often injured, making the car difficult to couple and causing much loss of time in making up trips.

Referring to the claim of some that iron cars when derailed are much harder to again place them on the tracks than are wooden cars, let me say that my experience with iron cars in low coal is that they can be replaced on the track more easily and quickly than wooden cars of the same capacity. The reason is that there is so much give in a wooden car that one must lift higher before the wheels can be brought over the rails, than when lifting an iron car back on the track.

Wood Cars Require Constant Repairs Owing to the Severe Conditions of Use

The use of an endless chain for hauling trips up a slope is very hard on wooden cars, as is also a direct steam dump when that forms part of the equipment on the tipple. Iron cars stand this hard service much better and are seldom injured, while wooden ones are frequently disabled. At our mine, when employing wooden cars, a man was kept busy all the time doing nothing else but repairing those cars, while the only thing that had to be done to an iron car was to occasionally straighten down a drawbar. An iron car of the same outside dimensions as a wooden one has a greater capacity. About the only wear on a steel car is that due to corrosion, and this is so small as to be negligible.

In closing, let me say that it is the opinion of most men with whom I have talked on this subject that steel cars are rapidly replacing wooden ones, in coal mining practice, and that they are far superior and more economical in the end.

John T. Cox,
Pensacola, Fla. United States Naval Air Station.

Man Power and Longwall Mining

Letter No. 2—It was with the deepest interest, but with some misgiving, that I read the letter of Joseph A. Greaves, *Coal Age*, Sept. 19, p. 564. The manner in which he describes some of the minor difficulties in connection with longwall mining is indeed amusing; but it occurs to me that he has omitted some of the far more weighty and important difficulties in connection with starting longwall work.

Like Mr. Greaves, my experience in longwall mining was obtained in mines in the North of England, where we had no troubles of the kind he has described as being due to the employment of miners of different nationalities. Let me stop long enough, here, to say that there must have been something radically wrong with the haulage arrangement, in the instance mentioned by my friend, when Tony and Mike would fall to fighting over a single empty where 20 carloads of coal were down ready for loading.

Now, I fully agree with Mr. Greaves in the belief that longwall mining has peculiar advantages where the conditions are favorable to its application, but there are a lot of things that must be first considered in order to insure the success of this method. As I have said, Mr. Greaves has seemingly overlooked these important features. However, it may be that the longwell mentioned in his letter was only in its infancy and had not reached a point where real trouble begins.

Success of Longwall Depends on a Right Start

Everything depends on the manner in which longwall work is started. One must be familiar with what is sure to happen if the work is not started right. Study well the conditions. Good judgment must be used in deciding whether it is better to take bottom or top for the packwalls. To make a mistake in this regard will give no end of trouble when the face has advanced a considerable distance and the weight of the overburden rests fairly on the packwalls. It is then that the roof will more than likely show a tendency to cut along the face. To overcome this difficulty, which would mean disaster, it is important to have large and well-built packwalls that will take the weight and throw it back on the solid coal.

My recollection goes back to the time when I was employed in a longwall mine where I gained the first ten years of my mining experience. In that mine, the seam was about 39 in. in thickness, and the packs would be squeezed down to 30 in. some distance back from the face. The packwalls were well built, bottom being lifted to supply the material for that purpose. The gateways were 36 ft. apart, center to center. Not a prop was permitted to stand in the gob, but the packs were built solid from one gateway to another.

The roof of the seam was a slate that could be readily taken down when this was required to make headroom on the roads. I never saw a wood chock set in any gateway, except at the corner of each gate, which is all that is necessary, I believe, provided the packwalls are well built. The work was all pickwork and no explosive was used except to shoot bottom. The work in this mine was entirely successful.

In contrast with the foregoing, I recall working in another mine where it was decided to start longwall,

in a single section of the mine. The conditions there seemed favorable and a pair of entries were driven far enough to start eight gateways. I think these were driven on about 70- or 80-ft. centers and the back entry was used to ventilate the longwall face. Men were set to work to slab both sides of the main heading its entire length. A wood chock was set at the corner of each proposed gateway, and the roof was shot down over the gateroad, the rock being used for packwalls.

This instance of longwall work would compare well, I believe, with that described by Mr. Greaves. "Coal getting" was the chief object for the first few weeks. Then the roof began to break along the face and settled hard on the packs, causing the cars to scrub both the sides and the top. The nightshift could not shoot down the top and build the packwalls fast enough, and it was no uncommon thing to see half the loaders digging bottom on the roads to get the cars into the face. Under these conditions, it will surprise no one to know that very much rock had to be loaded out. Altogether it was a miserable piece of work. I stayed there long enough to know that they had made a mistake in the start.

Let me repeat, then, in closing, start your longwall right and it will be sure to succeed if conditions are favorable. Do not expect to see the coal continue to pour out, as many do, in the first few weeks; but give attention to what is necessary to success in the future when the work is well under way.

McIntyre, Penn. THOMAS HOGARTH.

Hindrances to Coal Production

Letter No. 4—There may be a good deal of truth in the remarks of "Observer," made in his letter, *Coal Age*, Sept. 26, p. 612, where he speaks of men "passing the buck." The expression is seemingly intended to infer that men are prone to shift the responsibility from their own shoulders to those of others who are working under them.

Now, I believe I am in a position to know something of the inside workings of affairs, under conditions similar to those to which he has referred. As far as I am able to observe, the coal operator, today, is not leaving a thing undone that will help to increase the production of coal. Officials are ordered to "get out the coal," and reminded that it is up to coal producers to *win the war*. They are not sparing any reasonable expense, which is a secondary consideration at the present time.

During the past year I have attended meetings of all kinds, having for their object the speeding up of production. We all know that the expense sheet, in many cases, has gone clean out of sight; but I have yet to hear a single official blamed on that account. The sole question asked is, "What are you doing to speed up production in your district?" If a machine is needed at the mine it seems only to be a matter of how soon it can be gotten. My observation is that operators, almost without exception, are anxious and willing to try out any system that seems feasible and promises to increase the output of the mine.

Speaking of miners and their loyalty to the cause in which we are all interested at present, only the other day the Pit Committee came to me with a small grievance. It was a trifling matter, and, after listening to their complaints and suggested remedy, I pointed out to them that what they asked would be a detriment to them and to all concerned. I urged them to give their thoughts to what would increase the production of the mine 10 tons a day. I told them that I would gladly act on any suggestion of theirs that had this for its object and would even be willing to pay them for it.

The interview ended with my urging them not to go to their meeting seeking to bring up some little matter that someone was prone to consider a grievance when other and more important matters should be coming before them. Above all, I asked them not to consider that the mine foreman and the superintendent were on one side of the fence and they on the other, but rather to regard all as on the same side and pulling in the same direction to accomplish the same purpose.

Patriotism of Miners Should Lead Them To Overlook Little Troubles

Let me suggest, here, if our miners all possessed the right feeling, there would be no need for the foreman or superintendent to wonder, the morning following a meeting held by the men, whether the miners were going to work or not. While I believe that the vast majority of miners are loyal to our common cause, things frequently occur that cause me to doubt whether many of them realize what true loyalty means, in respect to their attitude in relation to trivial and unimportant matters. I am led to think that ignorance of existing conditions is often the reason why miners allow these little matters to trouble them.

In reading the letter to which I have referred, it appears to me that the writer blames the management of the mine for a few of the miners producing but six, eight or ten tons a day, instead of 16, 18 or 20 tons, as shown by the weigh sheet. While I am not familiar with the mine to which he refers, or its management, I can tell him where 99 per cent. of the trouble lies.

Reflect, for a moment, on the fact that from 20 to 30 men often depend for the coal they can load the following day on what a single machine runner can cut the preceding night. If that man is idle, or meets with difficulties beyond his control, it is clear that the men will have little coal to load the next day. Or, when the machine is cutting the coal on the dayshift, it may happen that several places are cleaned up at the same time, and the men working in some of those places must then wait until the machine can reach them.

Difficulty Arises When Machine Men Lay Off

In a mine where there are 10 or 12 cutters, it is the foreman's biggest job to know if all of these men are in their places. Perhaps, two or three of them have failed to come to work and the foreman must hunt up men to run their machines. He may have to take men who know little how to run a machine and progress is slow.

It may be argued that every mine foreman should have two or three extra cutters available. Even when this is the case it will happen frequently that they are working in places where they can earn more money than by running a machine. Here, again, the foreman cannot be blamed because the men have not the coal to load.

Again, there may be two or three of the machines in need of repair, and the machine boss can only be in one

place at one time, so that here is another cause for delay and loaders must wait for their coal to be cut. In visiting many places where the coal is cut by machine, I have never yet found a mine where there is never any trouble and delay caused by the coal not being cut ready for the miners to load when they come to work. Trouble of this kind will cease when we have machines that do not get out of repair and machine runners that are not prone to lie idle when the notion takes them. We should not be hasty in blaming these troubles on the management, who are often helpless to avoid them.

McIntyre, Penn. THOMAS HOGARTH.

The Miner and His Pleasure

Letter No. 5—I read with much satisfaction and pleasure the letter of Thomas Hogarth, *Coal Age*, Aug. 15, p. 329, regarding the right of the miner to enjoy himself. Like him and others who have expressed the same sentiments, I feel that the miner should have all the pleasure possible, as long as he does not let it interfere with his work in the mine or keep him from doing his whole duty to his country.

Reference has been made to miners owning autos, and the suggestion was offered that this fact might lead many miners to neglect their work in the mine, for the purpose of taking long pleasure trips and visiting their friends in distant places. Let me say that I cannot think of any class of people who are more entitled to own and enjoy an automobile than the miner who works underground, shut out from the light of day, in order to furnish the coal needed in other industries and in the homes.

MINERS' NEED OF RECREATION

No industrial worker makes as great a sacrifice, in this respect, as the coal miner whose hours are spent, day after day, in the dark, damp and dangerous recesses of the mine. I have spent 13 years of my life in the mine, and I know that after a man has worked steadily for months in an atmosphere loaded with powder smoke and poisonous gases, he needs rest and sunshine. He must have recreation in the sunshine in order to build himself up and strengthen him for doing more and better work.

My observation is that miners who own automobiles are generally the very ones that are found most regularly in their working places. Almost without exception, the owner of an automobile is a man who, by hard and steady work, has saved enough money to buy his machine. He is not the man who will allow the pleasure derived from its use to keep him away from his work in the mine.

We all know that it has been a hard task to keep the miner in his place this summer. It is in the summer season that many miners are accustomed to take their hunting and fishing trips and be gone for a week or two at a time. But I have noticed that very little of this has been going on the past summer. A few would go off Saturday night and be gone all day Sunday, but Monday morning would find them back in the mines stronger and better fitted for their week's work.

I have frequently overheard miners remark that they would go fishing and stay a couple of weeks if it were not for the war and the fact that the boys who have gone from them need their help in the mine. Miners recognize that coal is needed to produce the shells and other war munitions required at the front and their conclusion is that, "If the boys can stand it in the trenches, we can stay at our places in the mine." Patriotism runs high among miners, the large majority of whom feel that they must sacrifice everything in order to be able to face the boys when they come home. This fact and the dread of being known as a slacker has worked miracles with the average miner.

Miners, as a class, are hard to understand, and often misjudged by those who are not acquainted with mining conditions. It is true that the miner is prone to be suspicious of everything that will take away his liberty, which he prizes highly. Because he is frequently seen on the street, before the hour for quitting work in the mines has arrived, the remark is often made that he should be at work in the mine, instead of loafing and wasting his time on top when the country is in such great need of coal. If the truth were known, however, the man referred to has completed his day's work and could do no more if he had stayed in his place in the mine. His work below being finished, he has come up to enjoy an hour or more of sunshine that will fit him for work the next day.

A GOOD MINER UNJUSTLY CRITICIZED

An instance of this kind occurred not long since when a traveling man pointed to a large stout young fellow, a miner, who was resting in the shade an hour or so before quitting time. The traveling man remarked, "That fellow should be in the mine loading coal instead of loitering there." On being told that the man had loaded a day's turn and a good one at that, and that he could not have loaded any more coal that day had he remained in his place in the mine, the traveling man showed his ignorance of coal mining by remarking further that he thought every coal miner was supposed to stay in the mine and work eight hours' full time.

Criticism of this kind and articles of a similar nature that appear in the daily press, from time to time, do the hard working miner a great injustice. He is accused of idleness when his day's work is done and he takes his much-needed recreation in the fresh air and sunshine above ground, which alone can fit him for steady work, day in and day out. He is denied a vacation and the right of many enjoyments in life, by an unfeeling public, who know only of the great need of coal and are unfamiliar with its getting. As in the incident I have just mentioned, many who are so willing to criticise the miner for taking a little pleasure might themselves be employed in a more useful business. Many of them might, with a little training, enter the mines themselves and help to get out the coal.

My word, in closing, is that the miner should not only be given all the rest and sunshine possible, but encouraged to take it, in order that he may remain healthy and able to give the country his best service, every day that cars are on the track and his coal is cut ready for him to load. More often it happens that no cars are set in his place or his coal is not cut.

Cleaton, Ky. OSTEL BULLOCK.

INQUIRIES OF GENERAL INTEREST

Locating the Coal Beyond a Fault

Kindly permit me to describe briefly an experience we had recently in one of our mines, hoping that it may lead to a discussion that will not only prove helpful to ourselves but be of interest to others.

In Fig. 1 is shown the general plan of the entries, together with numerous cross-sections taken at the several points indicated on the plan, while Fig. 2 represents roughly a profile or vertical section taken on the line of the main headings. The profile shows two seams opened by drifts. As indicated in the figure the drift in the upper or "X seam" has been driven 2000 ft. where it intersected a fault.

As shown in Fig. 2, the lower or "Y seam" underlies the X seam, from which it is separated by 55 ft. of rock strata. Although practically level, both of these seams have a grade of 4 per cent. in favor of the loaded cars. As indicated in the figure, the drift or main heading in the Y seam is driven less than half the distance reached in the upper seam.

As appears in the general plan, Fig. 1, the main-drift headings in the X seam, are driven three abreast. The middle one, being somewhat in advance of the other

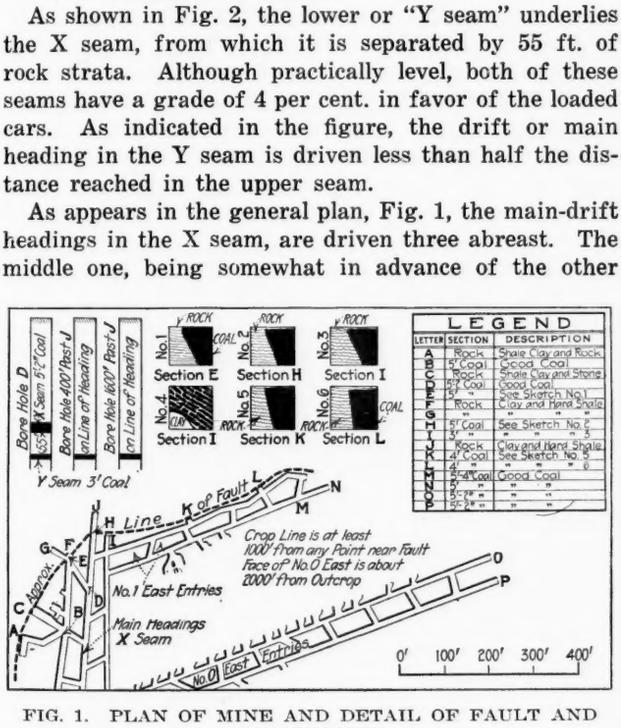

Bore Hole D
X Seam 5'-2" Coal
Bore Hole 400' Past J
in Line of Heading
Bore Hole 1600' Past J
in Line of Heading
Y Seam 3' Coal
Section E
Section H
Section I
Section I
Section K
Section L
LEGEND
LETTER SECTION DESCRIPTION
Rock Shale Clay and Rock
5" Coal Good Coal
Rock Shale Clay and Stone
5'-7" Coal Good Coal
5'-9" " See Sketch No. 1
Rock Clay and Hard Shale
" " "
" " "
" " "
Rock Clay and Hard Shale
4'-7" Coal See Sketch No. 5
5'-4" " " "
5'-4" Coal Good Coal
5'-9" " " "
5'-7" " " "
5'-9" " " "
K of Fault
H Line
Crop Line is at least 1000' from any Point near Fault
Face of No. 0 East is about 2000' from Outcrop
No. 1 East Entries
Main Headings X Seam
No. 0 East Entries
0' 100' 200' 300' 400'

FIG. 1. PLAN OF MINE AND DETAIL OF FAULT AND BOREHOLES

two, was the first to encounter the fault, which was of such peculiar sharpness that work there was stopped until the other two headings reached the fault. It was thought that they would establish the approximate line of the break and show, by the character of the strata beyond, whether the fault was an upthrow or a downthrow and help to ascertain the approximate amount of the displacement. However, when the two side entries struck the fault, the results were so indefinite and unsatisfactory, that it was determined to drive No. 1 *E* heading along the line of fault, and prospect the district by driving holes *K* and *L* directly into the fault.

We were now enabled to obtain cross-sections at the face of each of the three main headings and the holes driven to the fault at *K* and *L*. These cross-sections are shown in detail in the sketches Nos. 1, 2, 3, 4, 5 and 6, Fig. 1. Each of these sections is shown looking toward the right rib and the line of slip between the rock and the coal is clearly indicated in each, except in sketch No. 4 where the section is taken looking directly at the face and shows only rock strata above and a clay vein at the lower left-hand corner close to the rib.

After studying these sections carefully for a time, and being unable to obtain from them the definite information desired, we attempted to locate the coal beyond the fault by driving short boreholes up and down, in the face of each of the main headings. But these holes failing to show the presence of the coal, we next put down two boreholes, one 400 ft. and the other 1600 ft. ahead of the face of the main headings, as indicated on the profile, in Fig. 2. As there shown, the first of

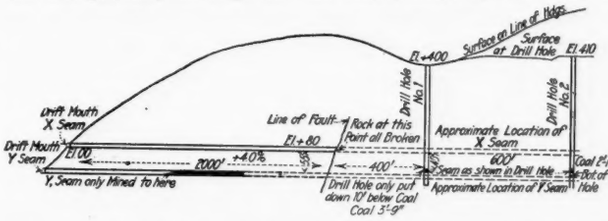

El.+400
Surface on Line of Hdgs.
Surface at Drill Hole El.410
Drill Hole No. 1
Drill Hole No. 2
Drift Mouth X Seam
Line of Fault
Rock at this Point all Broken
El.+80
Approximate Location of X Seam
Drift Mouth Y Seam El.00
2000'
+4.0%
400'
600'
Coal 2'-10" at Bot. of Hole
Seam as shown in Drill Hole
Y Seam only Mined to here
Drill Hole only put down 10' below Coal Coal 3'-9"
Approximate Location of Y Seam

FIG. 2. APPROXIMATE PROFILE ON LINE OF HEADINGS

these boreholes struck coal, 3 ft. 9 in. in thickness, at a depth that was approximately 45 ft. below the level of the X seam. This hole was put down only 10 ft. below that coal and further drilling was stopped.

The second borehole, 1600 ft. ahead of the face of the main headings, struck 2 ft. 10 in. of coal, at approximately the same level as that shown in the first borehole. It was thought, at the time, that these two boreholes had failed to locate the X seam, and that the coal struck was probably the Y seam. The Y seam, however, rarely shows 3 ft. 9 in. of coal, the average thickness of that seam being from 2 ft. 9 in. to 3 ft., in this region. The appearance of the strata at the face of the main heading, in the fault, indicates that the strata had been subjected to a tremendous pressure, as the rock there is much broken.

We are particularly anxious to get from *Coal Age* and its readers their opinions in respect to this fault. If it is not possible to locate the continuation of the X seam, it will mean a large loss to our company.

Johnstown, Penn. SUPERINTENDENT.

From the information furnished by this correspondent, it is the opinion of *Coal Age* that the fault is a downthrow. Our belief is that the coal struck in the two boreholes sunk from the surface is the continuation of the upper or X seam. Had the borings been carried a few feet deeper they would probably have found the Y seam below. Assuming the elevations given to be correct and making due allowance for the 4 per cent. rise in the strata, the indication is that this fault is a downthrow of approximately 45 ft. We hope to receive the opinions of others.

EXAMINATION QUESTIONS

Miscellaneous Questions

(Answered by Request)

Ques.—An anemometer registers 30,000 cu.ft. velocity per hour, in an airway 8 x 5 ft. What is the volume of air passing per minute and how will you ascertain whether the anemometer is in good working order?

Ans.—The question probably intends to say that the anemometer registers a velocity of 30,000 ft. per hour, which would be 30,000 ÷ 60 = 500 ft. per minute. Then, assuming that this is an average velocity for the entire section of the airway, the sectional area being 8 × 5 = 40 sq.ft., the volume of air passing per minute is 40 × 500 = 20,000 cu.ft. per minute.

An anemometer, in constant use, should be returned to the factory once in every one or two years, for the purpose of testing its calibration and determining the accuracy of its readings. A rough method of checking the reading of an anemometer in a mine, however, is the following:

Select a straight piece of entry 100 yd. in length where a good current of air is passing. Starting from the point of observation where the reading of the anemometer is to be taken, measure off this distance in the direction the air is traveling and place a man at that point. Now, expose the anemometer to the air current in the center of the airway, holding the instrument at arm's length so that the flow of air through it will be unobstructed.

With a watch in one hand, let a small flash of powder be touched off at the instrument and note the exact time by the watch when this is done. The powder should be in a position such that its smoke will be borne on the air current in the center of the airway. The observer at the other end of the stretch, 100 yd. distant, signals when he first detects the smoke of the powder at that point, and the time interval is noted by the watch. For the purpose of a check, the second observer also notes the difference in time between the flash of the powder, which he observes, and the time when he first detects the smoke.

The anemometer is now held exposed for the full length of the minute and its reading taken. Assuming the reading shows a velocity of 500 ft. per minute, the interval of time between the flash of powder and the detection of the smoke 300 ft. distant should be $\frac{3}{5} \times 60 = 36$ seconds, which would indicate that the reading of the anemometer is approximately correct. It is needless to say that this observation for determining the correctness of the anemometer reading should be made at a time when the mine is idle and the circulation of the air normally regular.

Ques.—With a fan of 30 hp., from which you are obtaining only 50 per cent. useful effect, while the water gage stands at 2.3 in., what quantity of air per minute should you get?

Ans.—With 50 per cent. useful effect, the horsepower on the air is one-half that developed by the fan, or 15 hp. Ventilating under a 2.3-in. water gage, the quantity of air circulated by 15 hp. is

$$Q = \frac{33{,}000H}{5.2w.g.} = \frac{33.000 \times 15}{5.2 \times 2.3} = 41{,}390 \text{ cu.ft. per min.}$$

Ques.—(a) What is the general efficiency of a fan? (b) If the horsepower of an engine is 40 and the water gage 1.5 in., what quantity of air wil you expect to get?

Ans.—(a) The general efficiency of a mine ventilating fan, including that of the engine driving the same, may be stated as varying from 60 to 80 per cent., depending on numerous conditions.

(b) Assuming in this case the combined efficiency of the fan and engine as, say 60 per cent., the engine developing 40 i.h.p., the power on the air is 0.60 × 40 = 24 hp. The quantity of air circulated by this power against a water gage of 1.5 in. is calculated by the formula

$$Q = \frac{33{,}000H}{5.2w.g.} = \frac{33{,}000 \times 24}{5.2 \times 1.5} = 101.540 \text{ cu.ft. per min.}$$

Ques.—(a) What pressure and power would be required to produce and maintain an air volume of 150,000 cu.ft. per min., through an airway 8 x 10 ft. and 3000 ft. long? (b) What would be the total power exerted by the fan engine if 70 per cent. of the power was expended on the air?

Ans.—(a) First find the sectional area, rubbing surface and velocity of the air as follows:

Sectional area, $a = 8 \times 10 = 80$ sq.ft.;

Rubbing surface, $s = 2(8 + 10)3000 = 108{,}000$ sq.ft.;

Velocity, $v = 150{,}000 \div 80 = 1875$ ft. per min.

The pressure per square foot producing a circulation of 150,000 cu.ft. per min. in this airway is then

$$p = \frac{ksv^2}{a} = \frac{0.00000002 \times 108{,}000 \times 1875^2}{80}$$

$$= \text{say } 95 \text{ lb. per sq.ft.}$$

The power producing the circulation is found by multiplying this unit pressure by the quantity of air in circulation and dividing the product by 33,000; thus,

$$H = \frac{Qp}{33{,}000} = \frac{150{,}000 \times 95}{33{,}000} = 431+ \text{ hp.}$$

(b) Assuming that the power on the air, as just found, is 70 per cent. of the total power exerted by the engine driving the fan, the latter is 431 ÷ 0.70 = 615 + hp.

Ques.—What would be the current required for a motor of 25 hp., at a pressure of 500 volts?

Ans.—Since one horsepower is equivalent to 746 watts and the current (C). in amperes, is aqual to the voltage (W) divided by the pressure or electromotive force (E), in volts, the required current, in this case, is

$$C = \frac{W}{E} = \frac{746H}{E} = \frac{746 \times 25}{500} = 37.3 \text{ amp.}$$

It is assumed in this solution that the motor is developing its full rating of power.

COAL AND COKE NEWS

Harrisburg, Penn.

In an opinion handed down by presiding Judge Kunkel, on Oct. 16, the intimation is made that a treaty between the United States and Italy may invalidate the Workmen's Compensation Act of this state. There is a provision in the act that non-resident aliens cannot collect compensation under the state law, and the contention has been raised that under the treaty relations with Italy, Italian subjects have the same rights in the courts of this nation as American citizens. If this contention is correct, the Judge stated that the provision in the act cannot stand. By ruling that the Dauphin County court had no jurisdiction in the case, the judge was not required to decide the question of the validity of the act.

The facts in the case in which this interesting question arose are as follows: The parents of Giuseppi Liberator reside in Italy, and he was killed in this state. The parents brought suit for compensation through their representative in this country, and sought damages. No claim for compensation was made to the Compensation Board because of the provision in the act, and when it came before the Judge, he ruled that the court had lack of jurisdiction.

The time limit for presenting the claim to the Compensation Board has now expired, and it is too late to take action before it. If the case had been heard by it, and appealed to the court, the question of the validity of the act would have been decided.

Whether the State of Pennsylvania goes dry and remains so until the end of the war, as a war measure, is up to the wholesale liquor dealers of the state. Unless they cease to supply "speak-easies" in the coal regions, the United States Government will declare Pennsylvania a military zone and shut out all liquors, particularly in the soft-coal fields. None of the licensed wholesale and retail dealers now closed by order of the State Board of Health to prevent the spread of influenza will be permitted to reopen, and this state will join the list of permanently dry ones.

The decrease of production due to the influenza has become serious. In the Central Pennsylvania district it amounted to 250,000 tons the last two weeks. Coupled with this is the loss due to drunkenness. There are more than 1200 mines in this district. If only one man at each mine were idle it would mean 1200 tons daily and a loss in tonnage of 6000 tons a day. The average of idleness due to liquor is considerably greater than this. The loss of production in the anthracite region due to the influenza is estimated at about 25,000 to 35,000 tons daily.

Uniontown, Penn.

That liquor is a serious hindrance to the production of an increased tonnage of coal is conclusively proved in the weekly report of Manager of Production W. L. Byers for the week ended Oct. 12. During that period the imposition of health orders due to the Spanish influenza epidemic closed every saloon, distillery and brewery in the region and provided the first opportunity in history to put to the test the operators' contention that the unlimited distribution of liquor reacted against the man-power efficiency of the region.

Another new high record for the Connellsville region was established during the week, the output of 749,384 tons in terms of coal topping the previous high record for the week ended Sept. 18 by 4541 tons. The gain of 31,547 tons as compared with the production for the week ended Oct. 5 is credited almost entirely by fuel administration officials to the declaration of the "dry zone" by the state health order.

The battle between opposing financial interests for the control of the Thompson Connellsville Coke Co., one of the "war brides" of the Connellsville coke region, will be settled in open court under the supervision of Judge J. Q. Van Swearingen, presiding judge. Judge Van Swearingen on Saturday, Oct. 19, filed an opinion and order in which he directed that the annual meeting of the stockholders for the purpose of electing officers and directors be held in open court. The annual stockholders' meeting was originally scheduled for May 6 last but was restrained by an injunction when the present controversy developed.

Balance of voting power to control the election seems to rest in a block of 2500 shares of stock, involved in the J. V. Thompson tangle, which was placed as collateral to secure his indebtedness with a Pittsburgh banking institution. J. H. Hillman, Jr., a prominent Pittsburgh operator and coal broker, who has recently acquired extensive interests in the Fayette County region, purchased the block of stock a few days before the scheduled meeting of the stockholders but was denied the right of transferring it to his name for the reason that the stock transfer books had then been closed until after the election. Harvey R. Worthington and others then petitioned the Fayette County courts for an injunction, and at the hearing Mr. Hillman entered into the controversy as one of the plaintiffs.

In the decision just filed Judge Van Swearingen finds from the evidence offered that unless the court exercises its powers to supervise and control the corporate election for directors there is real danger that the meeting of the stockholders will be subject to confusion, disturbance and disorder, and that the election will not be fairly, impartially and legally conducted.

The trouble began when the majority of the present board of directors desired to make distribution of large sums of money as dividends to the stockholders, while the other directors insisted on first paying the company's indebtedness. The company has a capital stock of $3,000,000. It owns large coal properties in Fayette County and conducts extensive mining operations. John P. Brennen is president of the company and W. G. Rock is secretary and assistant treasurer. Other members of the present board of directors are John M. Reyburn, A. S. Livengood, J. V. Thompson, Edward R. Jenkins and Andrew A. Thompson. The court did not name a date for the stockholders' meeting.

Charleston, W. Va.

Operations in the Fairmont district are still wrestling with late placements and a very meager car supply. For instance, on Oct. 12 there were only 798 cars in the region and only 503 were placed by 7 o'clock. The day before, despite the fact that only 500 cars were placed by 7:00 a. m., 1095 cars were loaded. Car service in the Fairmont region has been about as poor as it could be for the last two months or more, and the production loss has consequently been very large through no fault of the operators or miners.

Decreases in production have followed in the wake of sickness in the Kanawha district, although the tonnage produced even under such a handicap is greater than it was at any time during September. As if a labor shortage were not enough, for the last three days of last week there was an acute car shortage, attributed by the Chesapeake & Ohio to the fact that so many engines were in shop. Tonnage figures for the week ended Oct. 12 show 171,096 tons of coal produced, this being a reduction in the output of 33,000 tons. It is easy to put one's finger on the trouble as the total number of hours worked was only 5228, hours lost from labor shortage being 556 and from car shortage 1155. Spanish influenza was on the rampage in certain parts of the district.

Through causes over which neither miners nor operators have any control it is doubtful if the mines of the Tug River and Pocahontas districts are able to reach the two-million ton production goal set for October, although a herculean effort is being made to achieve such a result. Up until the 12th shipments of coal had aggregated 14,129 cars. Taking into consideration the reduced man power in the district and the prevalence of Spanish influenza, the record so far is considered very good. There are 1800 cases of influenza in the two fields and 2600 cases among railroad employees. An increase under such conditions indicates how hard the men are working to reach the quota fixed by the Federal Fuel Administration.

With Spanish influenza spreading very rapidly in both the Tug River and Pocahontas districts, the output of 462,757 tons, for the week ended Oct. 12, even though a decrease of 6975 tons as compared with the previous week, is considered very good. The epidemic has not only affected the mining industry but also the railroads.

The total production in the New River and Winding Gulf fields the week ended Oct. 12 was 298,887 tons, which was an increase of 14,300 tons over the preceding week, the preceding week, however, having shown a decrease over the week previous. The increase was accomplished despite many obstacles. At least 1000 tons was lost at one mine through a wreck. Another wreck in the New River field curtailed production by at least 1500 tons. It is estimated that influenza in the mining districts is causing at least a 10 per cent. loss in production in the New River and Winding Gulf field. The same disease has also affected the railroads, the movements of trains being seriously interfered with.

Birmingham, Ala.

Mining operations in this district are not being affected to any appreciable degree by the wave of influenza which is sweeping the country, despite alarming reports to the contrary. This statement is borne out by the coal production figures for the week of Oct. 5, which have just been released by the Federal Fuel Administration bureau, showing a production of 409,022 tons of coal mined during the week. This is a substantial increase compared to the figures of the week previous, when an output of 383,067 tons was recorded. For the week ending Oct. 12 unofficial estimates show a further increase in output.

Beginning of a limited service by the Federal Railroad Administration of the Warrior River Barge line is affording opportunity for the movement of bunker coal from mines along the river which have no other means of getting their product to the markets. The Payne's Bend mines of the DeBardeleben Co. are now shipping upward of 200 tons of coal per day via barges, while the Franklin Coal Co., on the Locust Fork branch of the river, is shipping coal that was accumulated before the river transportation system was inaugurated. Full service on the river is to be started within another three weeks.

Transportation companies in the district are working hard to keep pace with the demand for service being made by consumers, and as a result car service in the coal section is somewhat improved, though there is still some room for complaint.

PENNSYLVANIA

Anthracite

Shenandoah — The main office of the Thomas Colliery Co., operated by the Madeira Hill Coal Co., of Philadelphia, was destroyed by fire on Oct. 9, together with records, important maps and valuable papers. The fire was caused by crossed electric wires. The breaker was saved by the heroic work of firemen.

Carbondale—Purchased at sale in bankruptcy on Aug. 22, 1917, for $40,000, the property of the West Mountain Coal Co., comprising in all 684 acres on the surface, and including large quantities of mine equipment, dwelling houses, barns, etc., and two large culm banks, holding thousands of tons of coal, has been sold to Max B. Smith and James V. Pinazzi, of Brooklyn, N. Y., for $93,000.

Minersville—The influenza epidemic situation here is appalling. Application was made to the state authorities for martial law, and it is expected the town will soon be under full control of the State Police. The local authorities say the situation is entirely beyond them. Corpses are being found which have been lying in houses for several days without attention, and sick and dead are being found together. It is expected to completely isolate the town. Graves cannot be dug fast enough on account of the scarcity of labor, and friends and members of families are being called upon to perform this work.

The Buck Run colliery, on which the town depends for support, has been compelled to close down.

Bituminous

Uniontown—As the result of a personal request from Fuel Administrator Garfield about 95 per cent. of the miners and the men employed at the coke plants worked on Liberty Day.

Greensboro—The Greensboro Coal Co. has received a permit to construct a coal tipple on the left bank of the Monongahela River at this place, about 2½ miles above lock No. 7.

Savan—The tipple at the new operation of Lowther & Davis, of Indiana, was put into commission this week. The mine is opened on the Hamilton tract in the Upper Freeport vein. The capacity is about 100 tons per day at the present time.

Blairsville—The Davis Coal Co. has opened a new mine on the Campbell farm near Smith Station to secure a block of coal which could not be reached from the old mine. The new mine has a production of about one car per day at the present time.

Pittsburgh—The tract of coal known as the Murray holdings and owned by Leander G. Edward, and Bertram G. Murray, comprising 155 acres in Frazier Township, has been sold to the Crucible Fuel Co. of Pittsburgh, a subsidiary of the Crucible Steel Company of America. The consideration was not mentioned.

Greensburg—Believing that a long "dry spell" is to be established, Italians and Austrians, particularly, are purchasing grapes in carloads in the mining sections in this county for conversion into wine. Reports from the "moonshine" sections in the Laurel Hill Mountains indicate a revival in the "mountain dew" business.

Brookville—Application will be made for a charter for a coal company to be known as the Sunday Hollow Coal Co., by Ira J. Campbell, Joseph B. Henderson and John E. Geist. Several hundred acres of coal have been purchased near Putneyville, in Armstrong County. The vein has been tested by drilling and the coal is said to be of a good thickness and fine quality. A switch will be put in, tipple erected, and the mine made modern in every respect. It is doubtful if the mine will be ready to produce coal this year.

Altoona—The Russett Coal Co., which supplies a large portion of the commercial and domestic coal used in Altoona, has started to electrify its mine and is installing electric shortwall machines. A new drift has been started and a tramroad proposed from this drift to the Buckhorn road. This will place the operation about four miles from the city on a downgrade haul. It will relieve the fuel shortage in Altoona, as the new operation will have a capacity of 500 tons daily. No railroad shipments will be made from this mine, all being hauled to the city in trucks.

WEST VIRGINIA

Dana—The shipment of coal from the plant of the Dana Coal Co., on Campbell's Creek, was begun last week. The plant was only recently completed. H. A. Jepson of Marting, will act as general manager.

Acme—In order to protect its Acme mine against any damage from floods, the Cabin Creek Consolidated Coal Co. of which Josiah Keely is general manager, is having a mile of rip rap work put in.

Charleston—A lease from Queen Land Co. conveying a tract of 1004 acres of Big Sandy district coal land to Kanely Coal Co., has been filed for record in the county clerk's office. The lease runs 20 years at a royalty of 10c. a ton.

Charleston—By Jan. 1 the Burch Fork Coal Co. expects to have its plant on Marsh Fork, in the Kanawha district, in operation. Construction work is being pushed under the direction of L. C. Lilly, the general manager of the company.

Ohley—A number of improvements have been made at the plant of the Coal Fork Coal Co. at Ohley on Cabin Creek, including the installation of a new motor and mining machine, the company also having put up a substation. The superintendent at this plant is S. W. Smith.

Clendenin—After several months' construction work, the new plant of the McBower Coal Co. at Clendenin, on the Coal & Coke, is almost ready for operation and it is probable that the shipment of coal will be begun in a few days. The general manager of the company is Max Goldman of Clendenin.

Laing—New equipment being added to the Berlin plant of the Wyatt Coal Co. at Laing, on Cabin Creek, includes an electric hoist, the company being engaged in making such improvements as may be necessary, under the supervision of James Martin, superintendent, to increase the company's output.

Fairmont—An agreement has been entered into between the United States Government and the Domestic Coal Corporation, recently chartered under the laws of Delaware, under the terms of which the Government will build the plant, now in course of construction at the old Fair Grounds here, but the corporation will operate the plant.

Fairmont—Spanish influenza has cut into the coal production considerably. The disease is prevalent everywhere in West Virginia and no coal fields have escaped. The Fairmont fields lost 20 per cent. in production the first two weeks of October, owing not so much to the disease in the mines, though the disease has since obtained a foothold, but to the interference with railroading. The Norfolk & Western fields, where the car supply has not been a source of worry, could not escape the epidemic and many mines are practically closed. The Chesapeake & Ohio field, which has had a good car supply recently, is crippled both as to railroad men and miners. The Big Sandy and Elkhorn districts of Kentucky, which adjoin one corner of West Virginia, suffers to such an extent that the output has been reduced 50 per cent. There are 1917 cases at Jenkins, Ky., where the Consolidated Coal Co. has one of the largest operations in the Big Sandy field.

Moundsville—An ineffectual effort was made the night of Oct. 11 to burn the tipple of the Panama Coal Co., near here, waste saturated with oil being found at the base of the tipple by members of the night crew who were leaving the mine when Night Watchman Hendricks gave the alarm.

INDIANA

Sullivan—Clyde Philips, a miner at Glendora, fell from the top of the mine tipple to the bottom of the sump, a distance of 125 feet, and escaped with only a fractured knee and a broken collar bone. He was doing repair work in the tipple when the bucket was drawn up from the shaft, knocking him from his position.

Oglesby—Members of Oglesby local union No. 929 have drafted resolutions asking for the opening of the mine of the Oglesby Coal Co., which was closed by a permanent injunction brought about by litigation of the Marquette Cement Manufacturing Co. The mine workers represented that many of them owned their homes in Oglesby and that they wished to remain there. It was also pointed out that the operation of the mine at this time would help the country.

ILLINOIS

Orient—The Orient No. 1 mine of the Chicago, Wilmington and Franklin Coal Co. hoisted, prepared and loaded for shipment during the week ended Oct. 12 a total of 32,514 tons of coal. The average output—5419 tons—was larger than any single day's output of any other mine in the southern Illinois field. On Oct. 10, with 738 men reporting for work, the mine hoisted 6008 tons, which is believed to be the largest single day's output ever reported.

Duquoin—Duquoin is to have a $200,000 hospital as the gift of Mrs. Lillie F. Browning who died recently while on a visit to Oklahoma City, Okla. In her will, which has been filed, she makes a bequest for that purpose and further directs that a trust fund of $40,000 is to ultimately go to the hospital. The institution will be named the Marshall Browning Hospital, in memory of her husband, who was president of the St. Louis & O'Fallon Coal Co., the St. Louis & O'Fallon Railroad Co. and the Western Anthracite Coal and Coke Co. He died in 1908.

Bethalto—The Bethalto Coal and Mining Co has been organized to take over the right to the Spencer mine on the Munsull place near here, the shaft of which has been filled with water for twenty years. When the shaft was sunk by John Spencer so much water was found that under the conditions then prevailing the mine could not be profitably operated. But it is different now. The new company, headed by George Prescott, has pumped out the shaft, made repairs and put the mine in operation. There is a 6-ft. vein under a rock top at a depth of 70 ft. The rights cover 175 acres.

Staunton—Five robbers held up the office force of the Mt. Olive and Staunton Coal Co., near here, Tuesday afternoon, Oct. 15, and escaped with $13,300 payroll money. The robbers drove up to the office in an automobile and while one stayed in the machine and another acted as lookout, the other three entered and with drawn revolvers drove three clerks, Otto Awe, Robert Barr and Frank Ballwek, into a vault. H. O. Panhorst, auditor and cashier of the company, was then bound to a chair with baling wire and two other men in the office, Charles Miller and Peter Schultz, were lined up against the wall. The robbers gathered the money from Panhorst's desk and drove away in the direction of St. Louis. When an attempt was made to use the telephone to give the alarm the wires were found to have been cut. The company has offered a reward of $500 for the capture of the robbers.

KENTUCKY

Drakesboro—The Black Diamond Mining Co. is installing a ten-ton ice plant for the use of its camp in taking care of foods, and furnishing ice.

Lebanon—Falling slate in the mine of the Willisburg Coal Co., near Harlan, Ky., resulted in the death of Charles Mills, a miner, while 15 men had narrow escapes. The level was choked with a mass of slate.

Mannington, Ky.—The Memphis Coal Mining Co. is arranging to commence work at an early date on the development of extensive additional property, to increase its present capacity. It is said that plans are being prepared for the construction of two new tipples, to be electrically operated, and ground has been broken for the erection of a new power plant for operation.

Henderson—The small but excellent mining property of the Zion Mining Co. has passed from the hands of Herman Mitchell and Chiel Moss to Murray Hughes, Oscar Abbott and Charles Hare. Hale and Hughes for several years have been with the Audubon Mining Co., Hale being mine foreman and Hughes an office man. Abbott is a prominent young farmer and head of the automobile firm of Abbott & Gerard.

TENNESSEE

Kingston—The Emory Gap Coal Mining Co., which recently filed articles of incorporation with a capital of $50,000, is planning for the immediate development of about 600 acres of coal properties in the Harriman section, to have a capacity of 100 tons daily. The company has arranged for the purchase of the necessary mining equipment, and will commence the installation at once. John W. Staples is president.

OKLAHOMA

Ada—Oklahoma is falling behind in its quota of increased coal production. About 94,000 tons more each month are being mined than last year, but the Federal Fuel Administration want 100,000 tons more each month.

COLORADO

Boulder—The Black Diamond Coal Mining Co., which is owned by Boulder capital is planning the erection of a new tipple and the installation of additional mining equipment with the view of increasing its daily capacity to 200 tons. Twenty men are employed at the mine under the management of George Williams. The coal is being hauled from the mine direct to the bins of the consumers by means of motor trucks with capacities ranging from 2 to 5 tons. Analysis of the coal indicates a fuel value of 12,000 B.t.u. W. E. Binder is president of the company.

MONTANA

Great Falls—Arrangements for the development of a new coal mine in the Belt district have been made by a company in which State Senator J. M. Burlingame and other local and Belt men are interested.

ALASKA

Cordova—It is reported that the mine of the Alaska Petroleum and Coal Co. in the Bering field is ready to ship coal for sale, as the Alaska Anthracite Ry. has completed the railway from the mine to Goose City, on Bering River. At Goose Bay the coal will be loaded on scows and taken to the steamship for shipment to Seattle. At the mine 50 men are working three shifts, and already a large quantity of coal has been sacked ready for immediate transportation. The coal is an anthracite and is said to be of superior quality.

Foreign News

The Hague, Netherlands—Announcement was made at the American Legation on Oct. 18 that the United States had offered to place at the immediate disposal of the Dutch Government 100,000 tons of coal monthly for the next twelve months or until the end of the war, on condition that Holland stop sending food to Germany. The coal is to be shipped in vessels sent from Holland.

Lens, France—It will be from 18 months to two years before it will become possible to take out any coal from the mines in the Lens region, which the Germans damaged to the best of their ability before they retired from the city. It is estimated that it will take five years to restore the normal production of the pits. At Courrieres, northeast of Lens, the Germans had blown up the mines before retiring.

Sydney, N. S.—The first battery of the new coke ovens of the Dominion Steel Corporation, comprising 30 ovens, has been completed and put in operation. The second battery of 30 ovens will be ready by the end of the year. When in full operation the output will exceed 1300 tons and the corporation will benefit materially through the saving of operating costs, as the new ovens can be operated by 200 fewer men than the old ones.

Amsterdam, Holland—The immense coal and iron and smelting works owned by Baron de Wendel in Lorraine have been sold to a German syndicate for the normal equivalent of $65,000,000 on the ground they were chiefly owned by French citizens. The process by which this great property was transferred from French to German ownership is called "compulsory liquidation." These fields have long excited the cupidity of German capitalists. The potential ore supply in this field alone has been estimated at $1,900,000,000.

The Hague, Netherlands—The "Neue Freie Presse" reports that the coal problem in Austria-Hungary has become serious on account of the great reduction in output of the mines. It is stated that conditions may not be expected to improve very much and that every possible saving must be effected in order to avoid a coal famine. It is urged that various industrial concerns should combine their operations so that they would consume less coal. During the first quarter of 1918 Austria's coal production was 275,000 tons less than in the corresponding quarter of 1917.

Personals

Baird Haberstadt, well known mining engineer and geologist of Pottsville, Penn., was married on Oct. 15 to Ida Ray Smith. *Coal Age* extends its congratulations.

Robert D. Reeder, superintendent of the Kennon Coal and Mining Co., Flushing, Ohio, has accepted the position of superintendent of the Stotesbury mine of the E. E. White Coal Co., to take effect Nov. 1.

H. C. Owen, of Fairmont, W. Va., has been elected secretary of the Coal Jobbers' Association of the Pittsburgh district, with headquarters in Pittsburgh. The association starts with a membership of about 50 jobbers.

Samuel J. Wilton, of Rockville, Ind., has been appointed assistant mining inspector to succeed **Thomas McNair,** of Clinton, Ind. The duties of the assistant are in the mine fields and include inspection of mines and machinery.

E. J. Best, former chief engineer of the Tennessee Coal, Iron and Railroad Co., and later associated with the Angema Steel Co., of Sault Ste. Marie, has accepted a similar position with the Woodward Iron Co., Woodward, Ala.

Harry Urban, formerly superintendent of the Fairfield byproduct plant of the Tennessee Coal, Iron and Railroad Company, Birmingham, Ala., has been appointed general manager of the Woodward Iron Co., Woodward, Ala.

John T. Darrah, a prominent designing and contracting engineer, connected with the McCrossin Engineering Co., died Oct. 13 at his residence in Birmingham, Ala., after a short illness from Spanish influenza. Mr. Darrah was 39 years of age.

John M. Roan, commissioner of the Ohio Compensation and Statistical Bureau, and recently named inspector for the Federal Fuel Administration for the entire United States, is recovering slowly from a serious automobile accident which occurred recently. While riding along near Wellston, Ohio, he went over an 80-ft. embankment and was rendered unconscious. He was found about three hours later by school children. Several ribs were broken.

Erskine Ramsay, for the past several years first vice-president and chief engineer of the Pratt Consolidated Coal Co. of Birmingham, Ala., has been appointed chief of conservation of the state by the Federal Fuel Administration. Mr. Ramsay has been identified with the mining interests of the Birmingham district for almost 30 years, and many of the improved methods of mining and handling coal are due to his skill and initiative. Mr. Ramsay has established his office at 848 Brown-Marx Building. Associated with Mr. Ramsay is **H. M. Gassman,** who from 1908 to 1916 was chief electrical engineer for the Tennessee Coal, Iron and Railroad Company.

Obituary

Walter S. Wells, president of half a dozen large coal mining companies of Eastern Kentucky, died on Oct. 16 at his home near Prestonburg, Ky., death being due to influenza.

Stewart Buck, paymaster for the Coal Run Mining Co. at Indiana, Penn., died on Oct. 11 after an illness of about one week. He contracted the Spanish influenza while paying the miners at Coal Run and this, together with pneumonia complications, caused his death. He is survived by his widow and one child.

Trade Catalogs

Maintaining Morale. Armstrong Cork Co., Pittsburgh, Penn. Folder. Points out the value of a proper drinking water installation if the workers are to be kept in good health. Without good health high morale and maximum production are impossible.

C-H Standard Attaching Devices. The Cutler-Hammer Mfg. Co., Milwaukee, Wis. Folder. Illustrates 21 of the various attaching devices manufactured by this company. Emphasis is placed on the fact that the C-H "Standard" attaching cap fits all C-H "Standard" plugs and receptacles,, as well as those made by five other leading manufacturers.

Jeffrey Belt Conveyors. Jeffrey Manufacturing Co., Columbus, Ohio. Catalog No. 175. Pp. 80, 6 x 9 in., illustrated. This new catalog of the Jeffrey company can rightfully lay claim to being a complete textbook upon the belt conveyor. Although compiled essentially for the purpose of promoting the use of the Jeffrey Conveyor, the purchaser's requirements for information have been covered in detail.

Industrial News

Chicago, Ill.—The Chicago Pneumatic Tool Co. announces the election of H. D. Megary to the office of secretary, vice W. B. Seelig, resigned.

Charleston, W. Va.—The Snuffer Coal Co., of which John Laing is president, at a recent meeting of its stockholders decided to discontinue business and surrender its charter.

Charleston, W. Va.—The Cabin Creek Consolidated Coal Company has announced the appointment of the following superintendents: Jno. Richard, at the Red Warrier mines: L. G. McCarty, for its United Mines at Wevaco; James Cole at Decota; J. M. Echols at the Quarrier mine.

Cincinnati, Ohio—A fleet of barges containing approximately 45,000 tons of coal arrived in this city recently from the Kanawha field. This is probably the last fleet to arrive in the city as a result of artificial floods caused by operating the various Government dams in the Ohio River. Approximately 250,000 tons of coal has reached Cincinnati as the result of artificial waves.

Duluth, Minn.—Receipts of coal at Duluth and Superior docks during September aggregated 222,015 tons of anthracite and 1,717,588 tons of bituminous, comparing with 315,126 tons of the former and 1,795,640 tons of the latter in the similar month last year. The falling off in receipts for the month is attributed to light stocks at the Lake Erie docks and congestion in railroad lines at that end.

New Albany, Ind.—The Ohio and Indiana Collieries Co., and Edward J. Hackett, of New Albany, were made defendants in two suits for damages of $10,000 each. The Central Indiana Lighting Co., at Columbus, Ind., in bringing the suit claims failure of the companies to supply coal on a contract made on July 25, 1916. Failure to supply plants at Fowler, Bedford and Salem is claimed by the Inter-State Public Service Co. in the other suit.

Columbus, Ohio—The Southern Ohio Coal Exchange announces production figures for the four weeks ending Sept. 28, showing that the output in the southern Ohio field was extra large. The figures do not include railroad fuel used by the lines on which the mines are located. The reports show that during the week ending Sept. 7, the production was 238,531 tons; week ending Sept. 14, 311,925 tons; week ending Sept. 21, 325,737 tons, and for the week ending Sept. 28, 298,358 tons, making a total of 1,174,551 tons for the four weeks.

Toledo, Ohio—The movement of coal from the Toledo docks to the Northwest is continuing satisfactorily, as is shown by the report of the loadings at the docks of the various railroads for the week ending Oct. 12. During the week the Hocking Valley docks handled 206,508 tons as compared with 188,467 tons the previous week, making a total of 4,082,653 tons for the season. During the same week the Toledo & Ohio Central Docks handled 91,000 tons as compared with 92,000 tons the previous week, making a total of 1,790,000 tons since the opening of navigation.

Washington, D. C.—The Draeger Oxygen Apparatus Co. of Wilkinsburg, Penn., has applied to the Federal Trade Commission for license to use eight patents for respiratory, resuscitating and breathing apparatus devices and the trade mark "Pulmotor," which they claim are enemy-owned or controlled. The patents were issued originally to Johann Heinrich Dräger, of Lubeck, Germany, and to the other assigners to the firm of Drägerwerk Heinr. and Bernh. Dräger, of Lubeck, Germany. The commission is considering the merits of the application.

New York, N. Y.—The Anthracite Committee has stopped the practice of certain producers of forcing steam sizes upon the domestic market by issuing the following order: "The committee is informed that certain producers and distributors are forcing steam sizes of coal upon buyers who are entitled to domestic sizes only. This practice the committee cannot under any circumstances permit, and all producers and distributors will be held responsible by the Federal Fuel Administration for either beginning or continuing these methods of moving steam sizes."

New York, N. Y.—Delos W. Cooke, state fuel administrator has announced the appointment of Wilson S. Kinnear as personal representative of the Fuel Administration in coöperation with the Anthracite Committee. Mr. Kinnear is head of the consulting engineer firm of W. S. Kinnear & Co., and was formerly president of the United States Realty Improvement Co. Previous to coming to New York, Mr. Kinnear was president of the Kansas City Terminal Co., and while chief engineer of the Michigan Central Railroad Co. he had charge of the construction of the railroad tunnel under the Detroit River.

Bowerstown, Ohio—Among the mines recently equipped with automatic cages made by the Mining Safety and Device Co., of Bowerstown, Ohio, are Old Ben Coal Corporation's No. 15, Carlinville, Ill.; Republic Collieries Co., Clinton, Ind.; Standard Oil Co.'s No. 4, Carlinville, Ill.; Republic Collieries Co., Russellton, Penn.; Delaware, Lackawanna & Western Railroad Co.'s Pettebone mine, Luzerne, Penn.; Bell & Zoller Mining Co.'s No. 2, Zeigler, Ill.; Lehigh Valley Coal Co.'s Blackwood Colliery, Blackwood, Penn.; Prairie Coal Co., East St. Louis, Ill.; Taylor Mining Co.'s No. 5, Herrin, Ill., and the Lehigh Valley Coal Co.'s Drifton Colliery, Drifton, Penn.

St. Louis, Mo.—Under a ruling of the Fuel Administration, the M. W. Warren Coke Co. will have to refund about $20,000 to purchasers of coal since July 8. Prior to that the basic price for coke was set by the Fuel Administration at $6 to $6.50 per ton, the retail price to be fixed by adding the lowest freight rate from the coke ovens nearest to St. Louis. The ovens at Connellsville, Penn., were then thought to be nearest. The freight rate was $3.60. But attention has been called to the fact that there are ovens at Earlington, Ky., with a freight rate of $1.70. The refund which the company is required to make is the difference between the two freight rates.

Cincinnati, Ohio—In the Federal anti-trust suit against the so-called "soft-coal trust," which has been pending in the United States Courts here for several years, a petition has been filed by the Central Union Trust Co. of New York as trustee of $2,294,000 of bonds of the Kanawha & Hocking Coal and Coke Co. asking the court for further instructions in connection with these bonds. The mortgage securing the bonds, it is alleged, provides that certain interest payments may be made after notice of default, and the company desires to know whether the mortgage shall be foreclosed, in spite of the fact that some of the defaulted interest has been paid, or whether efforts shall be made from time to time to collect interest coupons as they fall due. Hearing on this petition before the circuit judges will be set for a later date.

MARKET DEPARTMENT

Weekly Review

Peace Talk and Influenza Have Demoralizing Effect on Coal Production—Situation Not So Gloomy as Last Year—Soft Coal Output Keeps Up Well, Though Anthracite Continues to Present a Problem—Some Rumors of Contracts Being Offered

AND now peace talk and influenza have come to trouble the coal-mining industry. Premature reports of the surrender of Germany, printed by misguided and overzealous newspapers, led mine workers in many sections of the country to throw down their tools and enter into an orgy of celebration, with a consequent reduction in the coal output. More serious, however, is the havoc being wrought by the influenza epidemic. In the anthracite region production is being curtailed by the disease, and colliery after colliery has been forced to suspend due to lack of man-power. In the bituminous regions, particularly in central Pennsylvania, the epidemic has begun to make itself felt, and it is feared coal production will be completely demoralized unless success attends the endeavors of health officials and mine operators to eradicate the disease.

Having presented the dark side of the coal situation, justice demands the enumeration of more favorable factors. First and foremost is the belief that there will be no serious shortage of bituminous coal this winter. The needs of essential industries are being supplied as they become evident, and even nonessential industries are permitted to accumulate reserve stocks under a new order issued by the Fuel Administration. New England, which last winter was on the ragged edge of supply, furnishes no cause for anxiety this year, as all the New England ports, those on Long Island Sound as well as east of Cape Cod, have ample stocks of soft coal on hand.

Then, again, the production of soft coal keeps well ahead of last year. For the week ended Oct. 12, the output of bituminous coal is estimated at 12,321,000 net tons, a decrease of 273,000 net tons compared with the week preceding, but 1,317,000 net tons greater than the output of the corresponding wee in 1917. Soft coal production for the first nine months of the calendar year of 1918 is estimated at 447,905,672 net tons, an increase over the same period of last year of 36,179,783 net tons.

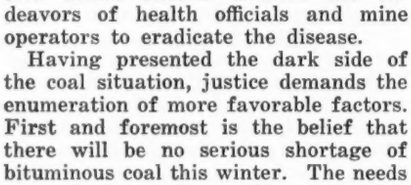
Anthracite coal still continues to present a problem, though the authorities are hopeful that all consumers entitled to this grade of coal will receive a supply before long. Though domestic demand continues heavy, the prevalence of warm weather has kept consumption down, and it is believed that household bins are unprecedentedly well stocked with coal. Production of hard coal, unfortunately, continues to decline. For the week ended Oct. 12, the output is estimated at 1,955,000 net tons, a decrease of 97,000 net tons compared with the week of Oct. 5. The total production of anthracite for the coal year to date amounts to 55,658,000 net tons, compared with 54,683,000 tons for 1917.

As for trade conditions, the stove and chestnut sizes of anthracite continue to be in the greatest demand, while the smaller steam sizes drag. Whatever rice and culm moves does so slowly, there being no active call for these two grades. A sign that the bituminous market is easy is evidenced by the fact that contracts are already being offered for next year, but on a twelve-month basis from Oct. 1. With rumors of the war coming to a speedy end, however, buyers are reluctant to commit themselves for a whole year to a contract based on Government prices.

WEEKLY COAL PRODUCTION

The production of bituminous coal during the week ended Oct. 12 is estimated at 12,321,000 net tons, a decrease compared with the week preceding of 273,000 net tons or 2.2 per cent., but an increase over the corresponding week of last year of 1,317,000 net tons or 12 per cent. The average production per working day during the current week is estimated at 2,053,000 net tons as compared with 2,099,000 net tons during the week of Oct. 5, and 1,834,000 net tons during the week of Oct. 12, 1917.

Bituminous coal production during the month of September, 1918, is estimated at



51,687,031 net tons, and exceeds production during the same month of 1917 by 6,579,073 net tons or 14.6 per cent. September production, limited, first by loss of time on Labor Day, second loss of time on Registration Day, and third, by the short month, was approximately 4,000,000 net tons less than production during either July or August, and fell slightly below the production of June but exceeded all records prior to June, 1918.

For the first six months of the coal year 1918, production of bituminous coal is estimated at 312,282,414 net tons as against 274,537,172 net tons during the same period of 1917, an increase of 37,745,242 net tons or 13.7 per cent. The requirements during these first six months of coal year 1918, however, exceeded the production during these months of last year by 49,448,828 net tons, so that even with the large increase, production during the first half year fell 11,703,586 net tons or 3.7 per cent. behind the estimated requirements.

Production for the first nine months of the calendar year of 1918 is estimated at 447,905,672 net tons, an increase over the same nine months of last year of 36,179,783 net tons or 8.7 per cent. This tremendous increase over last year was really brought about during the months of July, August and September, the increase during this period amounting to 24,234,681 net tons or 17.4 per cent., and more than doubled the improvement that occurred during the first six months of the calendar year, the increase during this period over last year amounting to but 11,945,102 net tons, or 4.4 per cent.

For the week ended Oct. 12, 1918, production of anthracite is estimated at 1,955,000 net tons, a decrease of 4.7 per cent. compared with the week of Oct. 5. The daily average during the current week of 326,000 net tons was lower than the daily average for the coal year to date during either 1918 or 1917. Total production for the coal year to date now amounts to 55,658,000 net tons compared with 54,683,000 net tons for 1917, an increase of 1.8 per cent.

Bituminous coal dumped at lake ports, (including bunker), during the week ended Oct. 12 exceeded the large tonnage dumped during the week preceding by 3.7 per cent. and is estimated at 1,240,848 net tons. Compared with the weekly average during the period July 1 to date, the current week's tonnage was 147,907 net tons or 13.5 per cent. in excess. The total dumping for the year to date now amounts to 23,940,060 net tons.

Shipments of bituminous coal to New England during the week ended Saturday morning, Oct. 12, are estimated at 465,350 net tons, a decrease compared with the week preceding of 29.9 per cent. Rail receipts during the week are estimated at 165,216 net tons, a decrease of 8.6 per cent. compared with the week preceding, and tidewater shipments which are estimated at 300,134 net tons, decreased 26.4 per cent. Shipments from New York and Philadelphia amounting to 81,774 net tons, decreased 32.6 per cent., from Baltimore, amounting to 42,727 net tons, decreased 35.3 per cent., and from Hampton Roads, amounting to 175,633 net tons, decreased 15.8 per cent. Shipments from Philadelphia during the week were extremely light, the tonnage reported above practically covering shipments from New York alone. The performance during the week ended Oct. 12 by both rail and water also fell considerably behind the weekly average for the coal year to date. Bituminous coal to New England for the coal year to date is estimated at 15,539,368 net tons, of which total receipts by rail are estimated at 5,932,754 net tons and tidewater shipments at 9,606,614 net tons.

Shipments from all tidewater harbors during the week ended Saturday morning, Oct. 12, amounting to 804,657 net tons, or 15.5 per cent. behind performance of the week preceding. All harbors report a falling off in tonnage loaded, Baltimore dropping behind 33.5 per cent. compared with the week preceding, New York and Philadelphia, 18.8 per cent. and Hampton Roads, 6.3 per cent. Current week's shipments from each harbor also fell behind the weekly average for the coal year to date. Estimates place the total shipments of bituminous coal from all harbors from Apr. 1 to date at 25,238,928 net tons.

The production of beehive coke in the United States during the week ended Oct. 12 is estimated at 597,000 net tons, an increase over the week preceding of 23,000

net tons or approximately 4 per cent. The average production per working day during the current week is estimated at 99,000 net tons as against 96,000 net tons during the week preceding. The operators in the Connellsville, Greensburg and Latrobe districts of Pennsylvania report production of beehive coke at 371,563 net tons, and the operation of their plants at 77 per cent. of their full time as against 75.5 per cent. during the week of Oct. 5. A slight improvement was reported in labor conditions during the week.

Operating conditions in the byproduct industry during the week ended Oct. 12 were approximately the same as reported by the operators for the week preceding. For the country as a whole the byproduct plants were operated for 91.9 per cent. of their full time and at a total loss of 8.1 per cent. The operators attributed a loss of 1.1 per cent. to shortage of byproduct coal, 0.6 per cent. to labor shortage, 5.3 per cent. to repairs to plants and 1.1 per cent. to other causes. Material improvement occurred during the week in Minnesota and New Jersey. In the former state the improvement is attributed to other causes while in New Jersey a better supply of byproduct coal and repairs to plants brought about increased production. Maryland was the lone state reporting falling off in production and is attributed by the operators to labor shortage.

BUSINESS OPINIONS

Marshall Field & Co.—Current wholesale distribution of dry goods is running slightly ahead of shipments for the same week in 1917. Road sales for at once delivery were about the same, while for those for future delivery were well in excess, especially for spring. Merchants have been in the market in slightly smaller numbers. Collections continue good.

Bradstreet's—The Government's win-the-war programme shows no let-up, and, indeed, increased efforts are being made to get out production, while at the same time orders have been issued to cut outputs in an additional number of lines that are deemed non-essential at this juncture, this policy being accepted as counter propaganda to the talk of an early peace. All advices continue to indicate marked paucity of labor or of crude materials, and where odd offerings of staple merchandise are made, ready absorption occurs.

The Iron Age—What would come to the steel industry from a sudden ending of the war has been a large factor in the trade comment of the week, yet not a disturbing one. Generally the view is taken that apart from shell steel, in which an early peace would cause some cancellations, the materials now most in demand would show no great falling off. Government shipbuilding would go on and rail and railroad equipment contracts would keep many mills busy for months. There is no abatement of the Government demand for shipments to France. A new order calls for 12,000 to 15,000 tons of portable track for France, or double the amount taken in the previous week for the same purpose.

American Wool and Cotton Reporter—The most important development of recent weeks in the wool situation occurred when H. E. Peabody, of the Textile Division of the War Industries Board, announced to the National Association of Spinners that it will be an absolute impossibility to apportion any amount of raw material to producers. It was stated that this condition will continue to Jan. 1, until a new tabulation is made of the raw material available, and that there was great uncertainty as to the possibility of release of raw material after Jan. 1. Thus the hopes of the manufacturers are dashed to the ground, at least for those manufacturers who had held to the opinion that wool in sufficient quantity was accumulating so that some allotment could be made. The cotton situation is decidedly uncertain.

Atlantic Seaboard

BOSTON

Receipts all-rail continue to sag. Embargoes still being placed against consumers who have been able recently to accumulate stocks. Water borne shipments fall off. Number of modern colliers now definitely withdrawn from coastwise service, but substitute craft not all arranged for as yet. Hampton Roads situation shows improved dispatch but fewer bottoms loading for New England. Tidewater ports at this end well stocked for the present. Contracts being offered for twelve-month periods. Movement of anthracite all-rail increases slightly over early October, but receipts by water show notable shrinkage. Influenza epidemic seriously affects shipments.

Bituminous—Commercial bituminous continues to show week by week a further reduction in movement all-rail to this territory, particularly from Central Pennsylvania. For the first seven days in October the average receipts at the five New England gateways were 407 cars daily, while for the next nine days the movement dropped to an average of 352. During the same period the receipts of railroad fuel have slightly increased, so that the total number of cars passing daily, railroad fuel and commercial bituminous combined, averages now but little over 550. This is a drop of 200 cars per day from the August average.

A large number of special requisitions placed through Fuel Administration channels have now been cancelled or suspended, but with the operators either these have been replaced by requisitions in favor of Government or special use at Tidewater piers, or shipments have been permitted to go forward on contract. In many cases shippers now free to start deliveries on contract find their consignees embargoed and are obliged either to seek orders from industries that are not embargoed or solicit railroad contracts. There are queries in the trade as to just what extent the fuel authorities will continue to shut off current requirements.

There is also a disposition to take into account the stocks of anthracite screenings now on hand at individual plants. There is a fallacy in this, for while there is hardly a plant that cannot run on bituminous alone there are extremely few cases where anthracite screenings can be used without a proportion of bituminous. In other words, to discontinue shipments of bituminous merely because a plant has an ample stock of barley would be rather a shortsighted procedure.

Receipts by water have also shown a marked decrease. This was only to be expected when heavy tonnages of Pocahontas were turned away from Tidewater and ordered to byproduct plants and for western requirements. And, again, there were indications when quite a number of the most serviceable modern colliers in the New England trade were provisionally requisitioned for overseas transport. These bottoms have now been definitely withdrawn from the coastwise trade, but boats to replace them have not yet been supplied to the extent needed.

At Hampton Roads the loading dispatch is tolerably good, except in rare instances. A large proportion of the coal available, however, is being taken for Government use, either naval or otherwise, and the number of bottoms loading for New England seems to be constantly growing less. There is no real alarm over this situation for the reason that stocks here are so favorable, especially on the part of those plants that depend more largely on water deliveries.

All the New England ports, on Long Island Sound as well as east of Cape Cod, are well stocked with bituminous and there is no present anxiety here over conditions at the loading ports. In fact, the discharging piers and all concerned with them are enjoying a welcome respite from unloading coal under pressure.

One of the unfailing signs of an easy market is now putting in its appearance. Contracts are already being offered for next year, but on a twelve months basis, from Oct. 1. There would probably be a mild sort of buying, were the delivery offered only to Apr. 1, but there is so much talk of the war drawing to an end that buyers hesitate to commit themselves to "Government price," for a period after Government price-fixing may have ceased.

Anthracite—Receipts of domestic sizes at the five gateways show a somewhat increased movement as compared with the first week of the month. The first seven days show an average of 406 cars, while the next ten days the average was something over 450 cars per day. The increase is probably caused in large part by the congestion at the New York piers.

Water-borne anthracite is coming forward more slowly and in less volume than at any previous time this year. Some of the congestion at the New York loading ports is due to other causes, but the big factor the past three weeks has been the influenza epidemic. To one of the companies this has continued to mean a loss of something like 10,000 tons each day. Not only is the coal not mined, because of sickness among the operatives, but train crews and pier men are also away from their places to such extent that coal is not brought to the piers except in dribbling quantities and even then there are vexatious delays in dumping. Barges are daily being taken away from some of the ports to load at other ports. The epidemic is past its high point in this vicinity, although it is still causing a serious loss in industrial output.

NEW YORK

Influenza reduces production and interrupts shipments. Dealers complain of lack of supplies while public calls for fuel. Cool weather and illness increase consumption. Buckwheat sizes in good supply. Bituminous market easier. Commercial coals in better supply. Storage regulations modified.

Anthracite—The ravages of influenza in the mining regions is being reflected in production and shipments with the result that less coal is being mined. Every town in the anthracite region is affected and many collieries are hard hit. All the producing companies are suffering from the lack of men and many of the mines have suspended operations at various times. Conditions have become so serious that physicians have been sent from this city into the coal fields to assist the local physicians in combating the disease.

The docks from which this market secures its fuel are also seriously affected. One instance of this is at South Amboy, where on Saturday last instead of a force of about 200 men being at work there were only between 35 and 40, the other men being at their homes victims of the epidemic.

Though the figures showing the number of cars dumped at the local docks during the week ending Oct. 18 indicate an increase over the previous week, the receipts by the local trade do not indicate that they are receiving anything like their requirements. For the seven-day period the cars dumped here aggregated 6050 cars, an increase of 896 cars over the previous week, the low record of the previous week having been caused by the explosion at Morgan, N. J., on Oct. 5, and which resulted in some of the docks being idle two days.

Most dealers complain of the lack of domestic coals. They have plenty of buckwheat and some pea, but the former is of no use for household purposes. They point out that consumers obeyed the mandate of the Fuel Administration last Spring and placed their orders for this winter's fuel. In many instances no deliveries have been made on these orders, although most of them were placed the early part of April, and consequently these customers are now without fuel enough to start their fires. In the meantime the public is being assured that everybody will be supplied with fuel sufficient to keep them warm, and the dealers are wondering where it is going to come from.

Egg, stove and chestnut are very short. Shippers say the demand for these sizes is far ahead of the supply, and the prospects for larger shipments are not encouraging now. These three sizes have been running in fairly good shape all summer, and while the dealers have many unfilled orders on their books, they have had an unusually busy summer and have put away in bins more coal than probably ever before during the summer months.

Pea coal is easy and much of this size is being substituted for the larger sizes where the customer permits.

Buckwheat and the smaller coals are plentiful. Considerable Buckwheat No. 1 is being stored for future use, while rice and barley are drugs on the market, certain individuals paring prices in order to move stocks. Most retail yards have more or less of these coal on hand.

Retail dealers are being seriously handicapped in their deliveries by the lack of help and the attitude of those who are employed. The latter in many instances refuse to put the coal into the customers bins although the order calls for it. Frequently the coal is dumped on the sidewalk and the customer is left alone to put it away as best he can.

Current quotations, per gross ton, f.o.b. tidewater, at the lower ports are as follows:

	Circular	Individual		Circular	Individua
Broken	$6.75	$7.50	Buck	$5.10	$5.90
Egg	6.65	7.40	Rice	4.65	5.10
Stove	6.90	7.65	Barley	4.15	4.30
Chestnut	7.00	7.75	Boiler	4.60	
Pea	5.50	6.25			

Bituminous—There has been a decided improvement in the local bituminous situation. More coal is available and spot buyers have been able to pick up stray cargoes occasionally. This latter condition is not expected to continue indefinitely now that the Fuel Administration has amended the storage regulations and cool weather is approaching.

The revised regulations permit all classes of consumers, except those in Class 1 as defined by the War Industries Board, to increase their reserve stocks, and those heretofore not on the preference list are

authorized to lay in additional reserve supplies.

Dumpings have improved during the week ending Oct. 18, reports showing 6448 cars dumped as compared with 5507 cars the previous week, an increase of 941 cars. Reports from the mine fields show a pronounced reduction in production as a result of the influenza epidemic, the figures from Central Pennsylvania indicating a decrease of 70,000 tons.

Shipments into New England and along the Long Island Sound have suffered much owing to the lack of labor at the loading docks, and it was estimated that 75 vessels were idle because of the failure to get coal for those points.

The surplus of commercial coal here resulted in a much easier market. There were no hurry calls for shipments and many shippers have plenty of coal. There were reports that some shippers were shading prices in order to save demurrage charges, but these were hard to locate.

The bunker situation is on the ragged edge. If the weather should suddenly become cold the situation would be serious with the coals now available for this purpose. As it is no ships have as yet been held up because of the lack of fuel, but there is no surplus in case of emergency.

Current quotations, based on Government prices at the mines, net ton, f.o.b., tidewater, at the lower ports, are as follows:

	Mine Gross	F.o.b. N. Y. Gross
Central Pennsylvania:		
Mine-Run, prepared or slack	$3.30	$5.45
Upper Potomac, Cumberland, and Piedmont Fields:		
Run-of Mine	3.08	5.23
Prepared	3.36	5.51
Slack	2.80	4.95

Quotations at the upper ports are 5c. higher.

PHILADELPHIA

Anthracite production seriously cut by influenza. Retailers also handicapped. Stove and nut in great demand. Public fails to take mixed egg and pea. City has 50 per cent. supply in cellars. Peddlers licensed. Price increase expected. Steam sizes drag, except buckwheat. Bituminous grows more plentiful. Non-war plants stocking up. Car supply equal to labor. Brokers to be investigated.

Anthracite—It has been a trying week for the entire trade. The production has been seriously cut, particularly in the Schuylkill region, and it is estimated that the loss at the present rate for a month will be close to one million tons. Reports show that each day more men are idle due to the prevailing epidemic of influenza, and the outlook for the immediate future is not bright. Some operators, such as the individuals, are especially hard hit, many of them suffering a loss of more than 50 per cent. of their tonnage. We know of a few instances of local dealers almost entirely dependent on such sources of supply, and they were almost out of business this week.

The dealers are all working shorthanded, and it has been noticed that many are hiring mere boys to tide over the emergency. The retail trade has been unable to properly care for the numerous hurry calls from homes where there is illness and no coal. They have done all in their power and have been put to considerable expense by delivering fractions of tons.

As for many weeks, stove and chestnut are in the most active demand and in the half-hearted coöperation of the public with the suggestion of the Fuel Administration to substitute a mixture of 60 per cent. egg and 40 per cent. pea for stove and nut. In fact, there are numerous dealers who have not sufficient stock of these two sizes to make any impression on their orders.

This week notice was issued to all peddlers and grocery stores handling coal by the bucket that they must procure a fuel administration license. The response was not very heavy at first, as many small dealers had such trouble in procuring supplies last winter that they are not liable to engage in the trade this year, and in addition many of them thought they were to be charged a license fee in addition to the regular city commercial license. The authorities have adopted a standard quarter-bushel bucket, with which all such dealers must provide themselves. The maximum price for nut has been fixed at 16c., with pea at 14c. Various other restrictions are placed about the business to assure fair treatment for the humble class of trade dependent upon this source for their fuel supply.

As to the steam sizes, we find that with heavy movement to the West and Canada buckwheat is well covered with orders. The smaller sizes drag and we have heard of rice price being cut. Culm moves very slowly. The situation on the latter two sizes is not relieved by the embargo on the sizes below buckwheat now effective on shipments to Port Reading. The explosion causing the closing of the piers at South Amboy also added to the difficulties of the small sizes.

The prices per gross ton f.o.b. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

	Line	Tide		Line	Tide
Broken	$4.90	$6.25	Buckwheat	$3.40	$4.45
Egg	4.80	6.15	Rice	2.90	3.80
Stove	5.05	6.40	Boiler	2.70	3.70
Nut	5.15	6.50	Barley	2.40	3.30
Pea	3.75	5.00	Culm	1.25	2.15

Bituminous.—The past week has been one of the best periods for the receipt of coal experienced for many months. To make a plain statement, there has been plenty of soft coal. Of course, one reason for this has been that the labor shortage caused by the epidemic has in some respects made this condition somewhat imaginary instead of real, because of transfers necessitated by the inability of some concerns to unload promptly. Following the ruling of the National Administration the non-war industries took advantage of the situation and at this time are getting pretty fair stocks of fuel. The distribution committee, however, is holding strictly to its rules of not allowing those concerns with a maximum supply on hand to increase it. The operators report a car supply equal to the labor supply. So far the bituminous region has not been greatly affected by the epidemic, but there are numerous cases, and fears are expressed that they will experience the same difficulty as the mines in the east.

It is rumored that the fuel authorities are contemplating weeding out concerns doing a brokerage business, many of whom they claim are not legitimate. It is understood that a questionnaire will be sent to all concerns selling coal on a commission, and in this way it is hoped to discover those who are doing a bona fide business.

BALTIMORE

Influenza makes big inroads on coal production and coal handling. Bituminous situation becoming tight again. Mild weather prevents more serious conditions for moment in regard to anthracite, but trouble is predicted.

Bituminous—Mines, railroads and coal-handling agencies in this section have suffered greatly from the epidemic of influenza and la grippe, which from the Baltimore city population alone has been counting from 500 to 2000 new victims daily, with a death list running from 100 to 250 per day. Every coal office force and yard force has been depleted by the ravages of the disease. Every mining district sending coal here reports a lessened production due to hundreds of miners being ill. Some days the past week the Baltimore & Ohio R. R. had as many as 40 per cent. of its operating men off active duty, and the shipment of coal over the lines dropped from a normal of around 2400 cars a day to about 1000. The result has been a distinct tightening of the soft-coal business. From an easy state where most industries here were able to keep their allowed reserve of from 15 to 30 days untouched, a number have seen their small reserves nearly wiped out and are appealing for shipments. The tighter market has stopped the tendency to reject box-car coal and wait for open-top shipments, which have been scarce both on line and harbor shipment. At present there is practically no open-top car coal either at tide for ordinary business or on line delivery, and the fuel administration is having no trouble now in disposing of the box-car coal coming through to its account. In the matter of distribution through purchasing agents of this coal, the national fuel administration has modified a former order of June 15, which allowed the Maryland administrator to select the agent to bill for the coals distributed by his office to consumers, irrespective of the former connection of the consumer with a coal supplying agency. The new order directs that the consumer be allowed to designate the purchasing agent or agency to bill for the coal supplied through the fuel administration, which designated agency shall receive the 15c. a ton commission allowed by the Government.

Anthracite—Only continued warm weather has prevented a bad situation here in regard to hard coal supplies. Not only are there thousands of homes without coal, the state administrator estimating that there are still about 175,000 tons of undelivered orders on the books, in addition to a large tonnage order demand which is being refused by dealers, but many homes in which persons are desperately ill with pneumonia have no coal. The dealers here have for the time being dropped all thought of the two-thirds delivery plan, which even the fuel administration officials now admit was faulty and over-optimistic, and are giving coal in one- and two-ton lots. The chairman of the city coal committee of the fuel administration believes that all homes can be supplied with a ton or two before real winter arrives; coal dealers do not believe it possible to do this in view of the light arrivals. There was a little spurt in receipts for a few days last week, but the deliveries are again in the old rut and far below requirements. Nut and stove coal are particularly scarce here.

Lake Markets

PITTSBURGH

Lake shipments decreasing but will continue to Nov. 15. Spanish influenza curtailing production. Byproduct plants supplied only with difficulty.

The diversion of larger tonnages of coal to retail dealers, upon the recent request of the local fuel administrator, has been decreasing the tonnage of Pittsburgh district coal shipped in the lake trade. In the week ended Sept. 28 the district's lake shipments were 351,000 tons, the shipments decreasing to 326,000 tons the following week, while there have been further decreases since. Hopes are entertained that the shipments can be kept at fully 300,000 tons a week for the remainder of the season, and the present prospect is that lake shipments will continue until about Nov. 15, or approximately to the end of the season of navigation.

Spanish influenza did not affect coal production of the Pittsburgh district until about the middle of last week, when reports began to come in from various quarters of very material reductions in the working forces and fears are entertained that before the epidemic is over there will have been a considerable curtailment in production. Previous to the middle of last week production was at substantially the best rate the district has ever seen.

The Pittsburgh district is furnishing practically a full supply of coal to the byproduct coke plants that depend on the region, but is barely able to maintain the supply and there has been no surplus for some time past for stocking purposes. With lake shipments extended to the middle of November there will be little chance of stocking thereafter, as local consumption will be heavier on account of the season. The district has been furnishing to the Clairton byproduct plant the amount originally asked for, 900 tons a day, remainder of the Clairton coal coming from the Lower Connellsville region. With seven batteries of 64 ovens each in operation the plant is consuming altogether about 7000 tons of coal daily.

There is practically no free coal in the market, substantially all the coal produced going out on lake shipments or against contracts and allocations.

TORONTO

Movement of coal light owing to heavy shipments to Upper Lake. Conferences of coal dealers for relief of householders without fuel. Conservation measures urged. Situation well in hand.

The movement of coal toward this city is light, owing to the heavy shipments which are being made to the Upper Lakes prior to the close of navigation, after which a marked improvement in the supply is anticipated. The list of householders who have stated that they have absolutely no fuel numbers 12,000. A conference was recently held between the local fuel dealers, the Board of Control and the city Fuel Commissioner at which the dealers agreed to supply ton lots to those without fuel within two weeks, the orders being apportioned among the dealers. The deliveries are being made on specified days when the filling of regular orders is suspended. From now on and throughout the winter dealers will only make deliveries to supply ordinary demands and no one will be permitted to have a large supply on hand. Instructions on coal conservation will be issued to householders, and it is hoped that if the public follow the advice given to substitute soft-coal, coke and wood for anthracite as far as possible the winter will pass without hardship due to lack of fuel.

BUFFALO

Sickness in the mines reduces output. Bituminous is fairly plenty. Jobbers not gaining more business. Anthracite coming in slowly, going up the lakes at fair rate.

Bituminous—The output of coal at the mines is sure to be cut down seriously by the prevalence of influenza, but it is not possible to say now how serious the reduction is going to be. Every effort is being made to keep the men at work, but they cannot of course do the impossible. But for that the work would have gone on well and the output made to show an increase.

The work of the jobbers is still as hard and unpromising as ever. They see no future to their part of the trade till conditions change. In fact they say that the tendency is to turn over more and more of the business to the zone managers. Consumers so often find that they must appeal to the fuel authorities that they often go there at the outset, and in that case the jobbers seldom get into the trade at all.

The general report is of a fair supply of bituminous all over the country. It is believed that a steady increase has taken place for some time and that there is now considerably more in consumers' hands than there was a year ago. Unless production is now seriously cut down the winter will be entered in better shape than for some years. The trade is tranquil. Government prices are rarely, if ever varied, though the jobber has never been reconciled to his small share of the profits.

Anthracite—The local retailer and consumer are engaged in complaining that they are discriminated against and that the city is bound to suffer next winter if the amount brought here for consumption is not increased materially before long. They declare that large numbers of consumers, some of whom have had their orders in since spring, are without coal and that there is none for them yet. From that side of it the situation is serious.

The wholesale and Government side tells a radically different story. It is declared that Buffalo has more coal in cellars than ever before at this time of the year and that if the distribution has not been fairly made it is because some one has managed to get more than he should. The fuel administrator's office reports that it has been able to fill every emergency order coming from families where illness from influenza has occurred. It is supposed that the lake trade is now getting first attention and that when that is ended for the season a liberal amount will be left in Buffalo.

CLEVELAND

Peace talk and influenza have been the governing factors in the Cleveland coal markets for the past week, the former bringing to the forefront speculations on after-war trade and period of readjustment, and the latter cutting sharply into production at Ohio mines. Lake coal is coming forward at the fastest galt of the season. The domestic trade also is faring considerably better—for the moment.

Bituminous—Production at Ohio mines is being reduced from 10 to 50 per cent. by the epidemic of Spanish influenza, according to operators. Lack of adequate medical attendance is being felt, and in instances entire mines have been down two and three days at a stretch. At present, conditions are certain to grow much worse before they become better, it is believed.

Optimism that has marked the views of operators here recently shows no diminution. Industrial stock piles, on the whole, are the largest in several years. The retail trade now is getting close to 50 per cent. of its requirements, and at least 75 per cent. of the homes in northern Ohio now have half or more of the soft coal they will need this winter. All told, there is more bituminous in northern Ohio today than for some time past, operators generally declare, and short of a disastrously bad winter no severe fuel shortage is possible. One operator goes so far as to predict that there will be a short market after Great Lakes navigation closes—about the middle of December—though he does not expect to see prices shaded much, if at all.

Anthracite—A thousand cars of anthracite in both November and December will see Cleveland's allotment for this year all in hand. Total shipments are estimated to be about 50,000 tons to date, but the city's proportion is only 40 per cent. of its normal requirements. Considerable No. 1 buckwheat has been coming in lately, but this grade is not very much sought. Receipts have been quite spotted, some dealers complaining they have not received over a half dozen cars in the past six months, while others have received a very fair percentage of their needs.

Lake Trade—Bituminous offerings at lower lake ports have been liberal the past week, but the tonnage loaded by the docks in the week ended Oct. 19 falls behind that of the week ended Oct. 12, which final official figures will show a record one for the season. Last week the docks were handling an average of 4000 cars or better a day, and the week's total hovers around the 1 200,000-ton mark. This week it has fallen to about the 1,000,000-ton mark. The first half of October has seen more than 2,000,000 tons loaded for the Northwest, while the entire month is calling for only 3,500,000 tons, according to schedule. Forest fires back of Duluth have lengthened the turn around at the head of the lakes, and the fleet will be found ultimately to have lost four or five days' time. Where a month ago operators were desparing of giving the Northwest its desired 28,000,000 tons, they now are being warned they must hold back some bituminous in order to provide ballast for the carriers that are going to make December trips.

DETROIT

Demand for steam coal appears easier, though supply is not excessive. Weather favors domestic consumers. Lake movement holds good volume.

Bituminous—Detroit consumers of steam coal are manifesting less active interest in the market than heretofore. Their easier attitude is attributed by jobbers to the fact that a number of the larger buyers have been successful in accumulating reserves of some size, while smaller concerns also have been able to get supplies in excess of current requirements. As the movement of coal from West Virginia and Ohio, available for use of steam plant, is now limited to slack and not very much of this is coming from West Virginia, the supply nearly offsets buying. Mines in Illinois are sending forward lump and prepared sizes more liberally. While the coal is not the state's best product, it is finding a market both with steam plants and with retailers.

But for the continuance of moderate temperatures many domestic consumers would be experiencing the hardship of fuelless homes. The domestic supply has been augmented by adding mine-run to the stock which mines in West Virginia and Ohio are permitted to ship to retail dealers serving household consumers. This compensates only in part for the continued scarcity of good domestic lump and prepared sizes, which are moving to the lakes under priority orders. There is still an urgent inquiry from domestic buyers, which suggests that many homes are yet without winter coal supply.

Anthracite—Representatives of the state fuel administration says a slight improvement is noted in receipts of anthracite the first two weeks of October compared with the similar period of September. The supply is still light, however. Of the 53,000 baseburner users whose applications for anthracite were received by the state fuel administration during the first ten days of September, approximately 23,000 have received delivery of sufficient anthracite to start the winter. The remaining orders, it is reported, are being filled at the rate of about 2000 daily. Should anthracite shipments continue at the present rate it is believed the baseburner users will be provided for within a month or six weeks.

Lake Trade—Shipments over lake routes are being facilitated by the plan under which dispatch of carriers is improved by assigning them to head of the lakes docks having speedy unloading plants. Cargo loading for the week ending Oct. 12 is reported to have been the heaviest of this season for a similar period. Shipments are likely to continue until Dec. 1 or later.

COLUMBUS

The Spanish influenza which is prevalent in many parts of Ohio is cutting production in all of the coal fields, but the reduction is not as great as might be expected. Miners are showing more patriotism and as a result the output is still good.

Production is being curtailed because of a great deal of sickness, due primarily to the epidemic of influenza. But miners are showing a good spirit because of the patriotic campaign which has been waged by James H. Pritchard, production manager for Southern Ohio, and are producing a good tonnage. The car supply is generally better. Production has been averaging about 75 to 80 per cent. of capacity in many of the producing fields of the state. Eastern Ohio is having a better car supply and as a result the output is better. Labor shortage is still having a bad effect on tonnage.

Domestic trade is still active and dealers are now accumulating surplus stocks in order to be in a position to take care of the rush when the mercury suddenly falls. There are fairly large stock of mine-run in the retail yards, and dealers are refusing to take that grade. Lump is being moved in limited quantities. The retail situation is generally good and little trouble is expected during the coming winter. Retail prices are firm at Government levels. Pocahontas is now out of the market and there is little anthracite to be had. Consumers in central Ohio are depending largely upon coal from the Hocking Valley and Pomeroy Bend fields.

The steam business is still a little soft because of the large production of screenings and mine-run which are not permitted to be shipped into the entire state of Michigan, the natural market; but modifications of the recent embargo have relieved the situation to a certain extent. It is reported that some producers are cutting prices of screenings, but these cases are isolated and will not affect the trade to any extent.

CINCINNATI

Domestic consumers are well supplied, and although influenza is hampering mining and transportation, other demand is also well taken care of. There is a fair car supply.

The coldest weather of the season has prevailed during the past week in this section, necessitating continued consumption of coal for heating purposes by householders, hotels, apartments, office buildings and the like. The extent to which summer storage, so often commented upon in these columns during the past few months, has taken care of this expected situation is indicated by the fact that there is no great rush to buy coal, but rather an actual let-up in demand, as compared with recent weeks. The average domestic consumer, in particular, is well taken care of, houses with basement furnaces being as a rule provided with very nearly their winter's supply of fuel, furnishing a decidedly good and unusual situation.

On the other hand, the industrial market has become a trifle soft in this vicinity, perhaps for the first time in several months, on account of the successful efforts of the mines to forward domestic coal and a correspondingiy large production of screenings. As the zone system limits coal from a given section to a given zone, a slight over-supply may, and at this time does, exist in this vicinity, although of course this does not mean that there is an oversupply of any variety of fuel, taking the country as a whole. The general prevalence of the so-called Spanish influenza has to some extent affected production at the mines, as well as the operation of trains, as many men have been seized with the disease; but so far this is not a serious factor in the situation, and it is hoped, with the vigorous preventive measures that have been taken, that it will not become so.

LOUISVILLE

Car supply fine, but influenza epidemic is holding back production. Mild weather creating some surplus of Western Kentucky domestic. Steam generally draggy.

Reports from all sections of Kentucky show that the car supply is adequate. While reports show that last week proved a big one in production for the country as a whole, in this district output was smaller due to illness in the camps. The influenza epidemic and diphtheria have caused a shortage of labor in some of the eastern Kentucky districts.

Mild weather has curtailed retail business materially, and for the first time in many months the retailers are beginning to advertise in the newspapers for business. The small concerns and newer organizations have been advertising steadily to build up business, but even the large established organizations are now going to printers' ink as surplus stocks are being unloaded in the yards. However, the western Kentucky mines are meeting with such a good demand for coal at the powder plant at Nashville, Tenn., that they are shipping mine-run to that point instead of overloading the market, as there is little demand for any grade of western Kentucky just now.

Eastern Kentucky lump is in demand, but none of this grade is coming on the Louisville market. Some screenings and mine-run are to be had, but no lump.

Practically no West Virginia coal has come to Louisville by the river since the first few days of the month. Low stages have made it impossible to bring coal down, there having been very few rains, and no artificial tides created. River coal companies at present are depending on western Kentucky rail shipments.

Steam coal of all grades appear to be a bit draggy on the Louisville market just now. The eastern Kentucky producers are

meeting with a fair demand for good gas and byproduct coal, but even with regulations modified on stocking are not securing enough business on screenings to enable them to produce much lump. Coal from the Elkhorn district is moving principally to byproducts plant. Harland and southeastern Kentucky coal is moving to the lakes and also to Georgia and the Carolinas for domestic, industrial and general use. This coal is only moving to Michigan for gas and byproduct consumption.

BIRMINGHAM

Coal production showing some improvement. Car supply satisfactory in most instances. Steam demand very easy. Domestic market brisk.

Reports from this field indicate that a gradual improvement may be expected from now on in the output of coal. For the week ending Oct. 5, 409,022 net tons were mined, according to official tabulations of District Representative Holmes, which was an increase of about 26,000 tons over the week of Sept. 28. Car service during the past week was good, and only in a few cases was any delay occasioned at mines on account of lack of equipment for loading. Production at some mines is being affected by the presence of influenza in the camps, but this disease has not assumed an epidemic stage to such an extent as to cripple operations seriously.

Small industries are apparently fairly well supplied with fuel and are not clamoring vigorously for shipments above quotas specified in orders. All priority orders of railroads were cancelled by the Fuel Administrator, effective Oct. 14, shippers being instructed to continue deliveries on the basis of priority stipulations in effect for the week ending Oct. 12. Though the market is easy there is no surplus coal for the spot trade.

Domestic sizes are in great demand and there is a deficit in the supply to meet present requirements. Official reports show that approximately 21,000 net tons was purchased and stored during September. Yards are still without stocks and unprepared for the cooler weather which will soon set in.

Coke

CONNELLSVILLE

Slight decrease in coke production, with prepondering increase in raw coal shipments. Coke quality improving somewhat. Market quiet.

Coke production in the region has shown a further though slight decrease, but this is possibly equalized by increased shipments of coal, as the major portion of the coal shipments are to byproduct coking plants. Spanish influenza is beginning to curtail working forces and more serious effects are expected from the epidemic before it is over.

Reports from blasts furnaces as to quality of coke received from beehive ovens continue of a favorable character, but there is still much improvement to be sought. Some furnaces, receiving coke from several different operations, report distinct improvement in coke from some plants and none whatever in coke from other plants. Nearly all blast furnacemen agree that the quality of much of the beehive coke received is far below former standards. There is complaint of high ash in the case of many cokes, of high sulphur in a few cases, and of coke being of too small size from many if not the majority of machine drawing plants. The number of plants using mechanical drawers has increased since labor became so scarce. There is practically no complaint as to quality of byproduct coke.

Practically all the blast furnaces seem to be sufficiently supplied with coke, in point of tonnage, but there is little if any opportunity to accumulate reserves. It is very rarely that furnace coke is offered on the market, and there are few fresh allocations, as deliveries continue to be made on old allocations. Foundry coke is offered in a limited way, some of it through brokers, who are generally able to collect a commission of 25c. from the sellers. Coke screenings from old dumps continue to be offered, but in smaller volume than before the Government price limit was reduced.

The "Courier" reports coke production in the Connellsville and Lower Connellsville region in the week ended Oct. 12 at 322,920 tons, a decrease of 7240 tons, and raw coal shipments from the two regions at 266,533 tons, an increase of 42,867 tons.

Middle Western

GENERAL REVIEW

Middle West mines producing record tonnages. Railroads not storing any coal, and result is a weak market. Central and northern Illinois mines in need of more business. Domestic trade shows improvement.

The entire Mid-Western coal-producing territory has apparently set out to please the Fuel Administration, as the tonnage produced from this district in the last week is going to equal, if not exceed, previous records. It is quite true that many favorable factors have helped the operators. For instance, plenty of cars, mild weather, and a fairly good labor situation. To counterbalance these things, the market continues weak, and at times erratic, and some operators are fearing a general epidemic of Spanish influenza in the mining districts.

To get back to present market conditions, the concensus of opinion is that there will probably be a break. With the enormous tonnage produced, and the present restricted zones, it is easily seen that something will have to happen, if the market is to remain firm. The railroads are not buying coal in any great quantities; in fact, it is said that only a few of the Northern railroads are in the market at all. The fact that the railroads are not purchasing coal, nor have they any in storage, accounts for in the opinion of many operators, the present weak market.

The southern Illinois field, considered as a unit, is well supplied with orders; in fact, the miners in this district have been behind on their shipments for over a year. Last week southern Illinois coal was easier than it had been for some time, but this condition has changed, owing to purchases made by a large public utility organization, and one or two railroads who have been temporarily in the market. Domestic sizes from Franklin, Williamson and Saline County are almost impossible to get, in spite of the fact that the average retailer has apparently as much coal as is needed for the present.

Central and northern Illinois producing districts are in need of more business. Even 6-in. lump and other domestic sizes can be freely purchased at Government price, while mine-run and screenings can be purchased considerably below that figure. The situation in Indiana is practically the same, with the exception, of course, of the Clinton No. 4 district, and one or two other fields producing very high grade fuels.

There is some little improvement in the domestic trade, as a number of retail dealers in the Northwest have come into the market with substantial orders. As the season progresses, and the hope of obtaining hard coal and high-grade eastern coals grows less, the retail trade will have to limit their purchases more and more to mines in Illinois and Indiana, rather than to the dock companies at the head of lakes, and the eastern producers.

CHICAGO

Almost impossible to sell steam coal. Domestic situation in bituminous is dull. Anthracite situation getting worse.

Chicago is proving a poor place these days in which to sell coal. It is almost impossible to place steam coal here, except at a discount from the Government price. Some of the biggest buyers are entirely out of the market, except when offered a decided bargain, and nine times out of ten are only interested on that basis, on the grounds of a personal favor. In short, if an operator has coal that must be sold, Chicago is a poor place in which to sell it.

The domestic situation is dull, so far as bituminous coal is concerned. All reports indicate that operators are receiving instructions to hold up shipments. The retailers claim that the spell of mild weather the city has been enjoying for the past few weeks has put a temporary stop to all buying. The anthracite situation is getting worse, rather than improving. It appears that all shipments of anthracite are being handled by the State Fuel Administration, and the way this organization is managing the job is causing a lot of adverse criticism. There is no indication either of any prompt relief of this hard coal situation.

MILWAUKEE

Mild weather dispels uneasiness in coal circles. Liberal receipts of anthracite by rail. Half of Wisconsin's supply in the hands of dealers.

The prevalance of mild weather, together with liberal receipts of anthracite by rail, tends to dispel uneasiness in coal circles. It is estimated that each day of the present weather saves about 6000 tons of fuel in Milwaukee. Between 300 and 400 tons of hard coal have been coming in daily by rail of late. No attempt is being made to store this coal, but it is passed right out to small dealers, who are thus enabled to make satisfactory inroads on delayed orders. About six weeks of lake navigation remain. During that period the receipts of anthracite will have to be above the normal if orders now on the books are to be supplied.

According to figures compiled at the office of the state fuel administrator, 50 per cent. of the coal ordered in Wisconsin for the winter of 1918-19 has already been delivered to dealers for distribution.

A statistical plan whereby it will be possible to prevent congestion of coal cars at any point and which will enable fuel administrators to tell at a glance where coal is needed most, has been perfected by Paul J. Weirich, of Monroe, Wis., fuel administrator for Green County. By the adoption of this system every county will receive equal distribution, and there will be no hardship because of improper consignment of fuel by administrators. No order will be filled unless the charts are consulted. The plans have received special commendation from the Federal Fuel Administration office at Washington.

Appleton, Wis., a prominent manufacturing center of the Fox River Valley, is undergoing a coal panic, which only the reception of fuel supplies will abate. Many families are closing their homes and seeking apartments and hotels. There is no reason why this condition cannot be corrected, however.

Coal receipts by lake thus far in October aggregate 53,111 tons of anthracite and 200,072 tons of bituminous, making the season's receipts of the former thus far 514,539 tons, and of the latter 2,967,749 tons.

ST. LOUIS

Overproduction of all kinds of coal in the southern Illinois field, and St. Louis is glutted. No domestic business at all from city or country, and steam business extremely light. Unbilled coal worries operators. Plenty of equipment and transportation improved.

Contrary to general expectations, and at a time in the year when everybody is worried about securing enough coal, the condition here is just the reverse. If there is any worry it is about where coal is going to be placed and how the mines are going to be kept running. The retail coal business in St. Louis is absolutely at a standstill. Many of the larger dealers have from one-eighth to one-fourth of their equipment working and the rest idle.

General conditions throughout the country sections are much the same. Orders are not coming in and inquiries develop the fact that the yards have put in the bulk of the coal required for the next couple of months. This pertains to practically all kinds of coal—Standard, Mt. Olive and high grade—whereas a few weeks ago there was a shortage on all kinds.

Steam business is slow. There is no storing to speak of, and the big buyer, figuring on lower prices, is holding off buying as much as possible.

The operators in the Standard field are facing a critical period, and the only thing that is going to keep their organizations intact will be the railroad business. At the present time this is coming through in fairly good volume, and every effort is being put forth to secure nearly all of the tonnage from the Standard district.

In the Carterville district and also the Duquoin district the operators are slowly but surely catching up with their orders, and there has been some free coal offered from this field in the St. Louis market this week. Some of the larger dealers here have shut off their shipments, and for the first time since last February, when there was a slight lull in the market, Carterville coal is being offered by the shippers on the open market for prompt shipment. This condition was not anticipated by anybody a few months ago and was not expected to happen until sometime next spring.

Fuel Administrator for Missouri, Wallace Crossley, has asked the United States Fuel Administration at Washington to litt the restrictions on industrial plants in Missouri storing coal so that the tonnage for Missouri may be absorbed and business kept going. There are no eastern coals coming in and an extremely light tonnage of Arkansas.

The prices are the same as previously, excepting that Standard screenings are from $1.50 to $1.60 and 2-in. lump has broken to $2.30 and $2.40.

On some of the coals from the Williamson and Franklin County field a 10c. special preparation charge is in effect. Very little of this coal moves into this territory.